

**EPA Superfund
Record of Decision:**

**FORT DEVENS
EPA ID: MA7210025154
OU 01
FORT DEVENS, MA
09/26/1995**

Text :

DECLARATION FOR THE RECORD
Shepley's Hill Landfill
Fort Devens,

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

STATEMENT OF PURPOSE AND BASIS

This decision document presents the U.S. Army's selected remedial action for Shepley's Hill Landfill Operable Unit, Fort Devens, Massachusetts. It was in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended, 42 USC 9601 et seq. and the Oil and Hazardous Substances Pollution Contingency Plan (NCP) as amended, Part 300, to the extent practicable. The Fort Devens Base Realignment and (BRAC) Environmental Coordinator; the Installation Commander; the U.S. Army Deputy Chief of Staff for Personnel and Installation Management; and the Director of the Waste Management Division, U.S. Environmental Protection Agency New England have been delegated the authority to approve this Record of Decision.

This decision is based on the Administrative Record that has been developed in accordance with Section 113(k) of CERCLA. The Administrative Record is available for public review at the Fort Devens BRAC Environmental Office, Building P12, Fort Devens, Massachusetts, and at the Ayer Town Hall, Main Street, Ayer, Massachusetts. The Administrative Record Index (Appendix D of this Record of Decision) identifies each of the items considered during selection of the remedial action.

ASSESSMENT OF THE SITE

Actual or potential releases of hazardous substances from the Shepley's Hill Landfill Operable Unit, if not addressed by implementing the response action selected in the Record of Decision, may present an imminent and substantial endangerment to public health, welfare, or the environment.

W0099518.080

DECLARATION FOR THE RECORD OF DECISION
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

DESCRIPTION OF THE SELECTED REMEDY

This remedial action is a source control action that addresses long-term risk of exposure to contaminated groundwater, the principal known threat at the Shepley's Hill Landfill Operable Unit. It consists of completing closure of Shepley's Hill Landfill in accordance with applicable Massachusetts requirements at 310 CMR 19.000, a monitoring and evaluating the effectiveness of the landfill cover system.

1993 at controlling groundwater contamination and site risk. The remedy c release of contaminants from wastes buried in Shepley's Hill Landfill and potential risk of future residential exposure to contaminated groundwater. components of the selected remedy include:

- landfill closure in accordance with applicable requirements of 319.000;
- survey of Shepley's Hill Landfill;
- evaluation/improvement of stormwater diversion and drainage;
- landfill cover maintenance;
- landfill gas collection system maintenance;
- long-term groundwater monitoring;
- long-term landfill gas monitoring;
- institutional controls;
- educational programs;
- 60 percent design of a groundwater extraction system;
- annual reporting to the Massachusetts Department of Environmental Protection and the U.S. Environmental Protection Agency; and
- five-year site reviews.

The selected remedy includes a contingency remedy if the selected remedy p ineffective at controlling site risk. The contingency remedy is groundwat and discharge to the Town of Ayer publicly owned treatment works.

STATE CONCURRENCE

The Commonwealth of Massachusetts has concurred with the selected remedy. Appendix E of this Record of Decision contains a copy of the declaration o concurrence.

W0099518.080

DECLARATION FOR THE RECOR
Shepley's Hill Landfill
Fort Devens,

DECLARATION

The selected remedy is consistent with CERCLA, and to the extent practicab is protective of human health and the environment, complies with federal a Commonwealth requirements that are legally applicable or relevant and appr the remedial action, and is cost effective. The remedy utilizes permanent alternative treatment technologies, to the maximum extent practicable for Hill Landfill Operable Unit. However, because treatment of the principal contamination was found not to be practicable, this remedy does not satisf preference for treatment as a principal element.

The contingency remedy, if implemented, would also be consistent with CERC the extent practicable, the NCP, be protective of human health and the env comply with federal and Commonwealth requirements that are legally applica relevant and appropriate to the remedial action, and be cost effective. T utilizes permanent solutions and alternative treatment technologies, to th extent practicable for the Shepley's Hill Landfill Operable Unit. The con remedy, if implemented, would satisfy the statutory preference for treatme principal element.

Because this remedy will result in hazardous substances remaining on site

based levels, a review will be conducted within five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection for human health and the environment.

W0099518.080

DECLARATION FOR THE RECORD OF DECISION
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

W0099518.080

DECLARATION FOR THE RECORD OF DECISION
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommend for immediate implementation:

U.S. DEPARTMENT OF THE ARMY

James C. Chambers
Fort Devens BRAC Environmental Coordinator

Date

W0099518.080

DECLARATION FOR THE RECORD OF DECISION
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommend for immediate implementation:

U.S. DEPARTMENT OF THE ARMY

Colonel Edward R. Nuttall
Installation Commander, Fort Devens

Date

W0099518.080

DECLARATION FOR THE RECORD OF DECISION
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

The foregoing represents the selection of a remedial action by the U.S. De
the Army and the U.S. Environmental Protection Agency, with the concurrenc
Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommend for immediate implementation:

U.S. DEPARTMENT OF THE ARMY

ARTHUR T. DEAN
Major General, USA
Deputy Chief of Staff for
Personnel and Installation
Management

Date

W0099518.080

DECLARATION FOR THE RECORD OF DECISION
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

The foregoing represents the selection of a remedial action by the U.S. De
the Army and the U.S. Environmental Protection Agency, with the concurrenc
Commonwealth of Massachusetts Department of Environmental Protection.

Concur and recommend for immediate implementation:

U.S. ENVIRONMENTAL PROTECTION AGENCY

Linda M. Murphy
Director, Waste Management Division
U.S. Environmental Protection Agency, New England

Date

W0099518.080

DECISION SUMMARY
Shepley's Hill Landfill
Fort Devens,

DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

Fort Devens is a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) site located in the Towns of Andover (Middlesex County) and Harvard and Lancaster (Worcester County), approximately 35 miles northwest of Boston, Massachusetts. The installation is approximately 9,600 acres and is divided into the North Post, Main Post, and South Post (Figure 1 in Appendix A). Seventy-three Study Areas (SAs) and Areas of Concern (AOCs) have been identified at Fort Devens.

This Record of Decision addresses groundwater contamination at the Shepley Landfill at Fort Devens. The Shepley's Hill Landfill includes three AOCs: sanitary landfill incinerator; AOC 5, sanitary landfill No. 1 or Shepley's AOC 18, the asbestos cell. AOCs 5 and 18 are located within the capped area of Shepley's Hill Landfill. The three AOCs are collectively referred to as the Shepley's Hill Landfill.

Shepley's Hill Landfill encompasses approximately 84 acres in the northeast corner of the Main Post at Fort Devens. It is situated between the bedrock outcrop of Shepley's Hill on the west and Plow Shop Pond on the east (Figure 2 in Appendix A). Plow Shop Brook, which drains Plow Shop Pond, flows through a wooded wetland at the southeast corner of the landfill. The southern end of the landfill borders the Defense Reutilization and Marketing Office (DRMO) yard and a warehouse area. An area east of the landfill and south of Plow Shop Pond is the site of a former railroad roundhouse.

A review of the surficial geology map of the Ayer Quadrangle shows that in the 1940s, the active portion of the landfill consisted of approximately 5 acres of Cook Street, near where monitoring well SHL-1 is located. The fill was north-south along a pre-existing small valley marked by at least two swamp kettle holes) and lying between the bedrock outcrop of Shepley's Hill to the north and a flat-topped kame terrace with an elevation of approximately 250 feet to the south of Plow Shop Pond. During the landfilling operation, the valley was filled in with the kame terrace, which may have been used as cover material, disappeared. Background information indicates the landfill once operated as an open burn.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

Landfill operations at Shepley's Hill Landfill began at least as early as July 1, 1992. During its last few years of use, the landfill received approximately 100,000 cubic yards of household refuse and construction debris, and operated using the trench method. There is evidence that trenches in the northwest portion of the landfill previously used areas containing glass and spent shell casings. The glass was deposited from the mid-nineteenth century to as late as the 1920s. The approximate elevation of the waste is estimated to be 214 feet above sea level at the north end of the landfill, 230 feet above sea level in the central portion of the landfill, and 230 feet above sea level in the south of the landfill. The maximum depth of the refuse is about 30 feet. The average thickness of waste is not documented; however, if the average thickness were 10 feet, the total volume would be over 1,300,000 cubic yards. Reports of flammable fluid discharges from the southeastern portion of the landfill have not been substantiated by observation or other research. The Army has no evidence that hazardous wastes were disposed of in the landfill after November 19, 1980. No waste hot spots or hazardous disposal areas were identified during remedial investigation (RI) or supply activities.

In an effort to mitigate the potential for off-site contaminant migration, the Army initiated the Fort Devens Sanitary Landfill Closure Plan in 1984 in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Massachusetts regulations entitled "The Disposal of Solid Wastes by Sanita (310 CMR 19.00, April 21, 1971). The Massachusetts Department of Environm Protection (MADEP) approved the plan in 1985. Closure plan approval was c with 310 CMR 19.00 and contained the following requirements:

grading the landfill surface to a minimum 2 percent slope in non operational areas of the landfill and 3 percent in operational a

removing waste from selected areas within 100 feet of the 100-ye floodplain;

installing a gas venting system;

installing a low permeability cap and covering the cap with sand and loam, and seeding to provide cover vegetation and prevent er and

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

implementing a groundwater monitoring program based on sampling existing monitoring wells every four months.

The capping was completed in four phases (see Figure 2 in Appendix A). In 50 acres were capped in October 1986; in Phase II, 15 acres were capped in November 1987; and in Phase III, 9.2 acres were capped in March 1989. The closure of the last 10 acres was accomplished in two steps: Phase IV-A wa 1991, and Phase IV-B was closed as of July 1, 1992, although the geomembra not installed over Phase IV-B until May 1993.

Because of the large area and shallow surface slope of the existing landfi of the landfill closure were completed with a 2 or 3 percent surface slope increased to 5 percent in Phase IV-B. Phases I through IV-A were capped w polyvinyl chloride (PVC) geomembrane overlain with a 12-inch drainage laye topsoil layer. At the request of MADEP, the Phase IV-B cap design was mod include a 40-mil PVC geomembrane, a 6-inch drainage layer, and a 12-inch t A landfill gas collection system consisting of 3-inch diameter gas-collect in a minimum 6-inch thick gas-venting layer was installed beneath the PVC geomembrane in all closure phases. Gas vents were installed through the P geomembrane at 400-foot centers. A minimum 6-inch cushion/protection laye maintained between the geomembrane and underlying waste. As requested by Environmental Protection Agency (USEPA) and MADEP, four additional groundw monitoring wells were installed in 1986 to supplement the five in the orig groundwater program. The Army submitted a draft closure plan to MADEP on 1995 pursuant to 310 CMR 19.000 to document that Shepley's Hill Landfill w accordance with plans and applicable MADEP requirements. Closure in accor with applicable requirements of Commonwealth regulations is a component of selected and contingent remedy.

AOC 4, the sanitary landfill incinerator was located in former Building 38 of Cook Street within the area included in Phase I of the sanitary landfil incinerator was constructed in 1941, burned household refuse, and operated 1940s. Ash from the incinerator was buried in the landfill. The incinera demolished and buried in the landfill in September 1967. The building fou removed and buried on-site in 1976.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

AOC 18, the asbestos cell, is located in the section of the landfill close Phase IV. Between March 1982 and November 1985, an estimated 6.6 tons of construction debris were placed in the section of the landfill closed during Phase IV. In 1990, a new asbestos cell was opened in the section closed during Phase IV. This cell was used until July 1992 for disposal of small volumes of asbestos-containing materials.

A more complete description of the Shepley's Hill Landfill Operable Unit can be found in the RI Addendum report, December 1993, Section 3, and the Feasibility Study report, February 1995, Subsection 1.2.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Land Use and Response History

Fort Devens was established in 1917 as Camp Devens, a temporary training camp for soldiers from the New England area. In 1931, the camp became a permanent installation and was redesignated as Fort Devens. Throughout its history, it has served as a training and induction center for military personnel, and mobilization and demobilization site. All or portions of this function occurred during World Wars I and II, the Korean and Vietnam conflicts, and operations Desert Shield and Desert Storm. During World War II, more than 614,000 inductees were processed at Fort Devens and it reached a peak population of 65,000.

The primary mission of Fort Devens is to command, train, and provide logistics for non-divisional troop units and to support and execute Base Realignment and Closure (BRAC) activities. The installation also supports the Army Readiness Region and National Guard units in the New England area.

Fort Devens was selected for cessation of operations and closure under the BRAC Act of 1990 (Public Law 101-510).

A more complete description of the Shepley's Hill Landfill Operable Unit can be found in the RI Addendum report, December 1993, Section 3, and the FS report, February 1995, Subsection 1.2.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill
Fort Devens,

B. Enforcement History

In conjunction with the Army's Installation Restoration Program (IRP), for the U.S. Army Environmental Center (USAEC; formerly the U.S. Army Toxic and Hazardous Materials Agency) initiated a Master Environmental Plan (MEP) in 1990. The MEP assessed the environmental status of SAs, discussed necessary investigations, and developed a schedule for completion of the investigations.

and recommended potential responses to environmental contamination. Prior environmental restoration at Fort Devens were also assigned. The MEP identified Shepley's Hill Landfill as a source of groundwater contamination and recommended additional groundwater sampling and a full RI to determine the extent of contamination.

On December 21, 1989, Fort Devens was placed on the NPL under CERCLA as amended by the Superfund Amendments and Reauthorization Act (SARA) as a volatile organic compound (VOC) contamination in groundwater at Shepley's Landfill, metal contamination in groundwater at the Cold Spring Brook Landfill (40), and the proximity of both locations to public drinking water supplies. The Interagency Agreement (Interagency Agreement [IAG]) was developed and signed by the Army and USEPA Region I on May 13, 1991, and finalized on November 15, 1991. The IAG provides the framework for the implementation of the CERCLA/SARA process at Fort Devens.

In 1991, the U.S. Department of Defense, through USAEC, initiated an RI for Group 1A sites (AOCs 4, 5, 18, and 40) at Fort Devens. The RI report was issued in April 1993, and an RI Addendum report was issued in December 1993. The purpose of the RI and RI Addendum was to determine the nature and extent of contamination at the AOCs, assess human health and ecological risks, and provide a basis for an FS.

An FS that evaluates remedial action alternatives for cleanup of groundwater at Shepley's Hill Landfill was issued in February 1995. The FS identifies remedial alternatives and provides a detailed analysis of five of these alternatives to allow decision-makers to select a remedy for cleanup of groundwater at the Shepley's Hill Landfill Operable Unit.

The proposed plan detailing the Army's preferred remedial alternative was issued in 1995 for public comment. Technical comments presented during the public comment period are included in the Administrative Record. Appendix C, the Responses to Comments, provides a summary of the comments and the Army's responses.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

The summary, contains a summary of these comments and the Army's responses, and describes how these comments affected the remedy selection.

III. COMMUNITY PARTICIPATION

The Army has held regular and frequent informational meetings, issued fact sheets, press releases, and held public meetings to keep the community and other interested parties informed of activities at Shepley's Hill Landfill.

In February 1992, the Army released, following public review, a community participation plan that outlined a program to address community concerns and keep citizens informed and involved in remedial activities at Fort Devens. As part of this program, a Technical Review Committee (TRC) was established in early 1992. The TRC, as required by SARA Section 211 and Army Regulation 200-1, included representatives from USEPA, USAEC, Fort Devens, MADEP, local officials, and the community. Until January 1994, when it was replaced by the Restoration Advisory Board (RAB), the TRC committee generally met quarterly to review and provide technical comments on schedules, work plans, work products, and proposed activities for the SAs at Fort Devens. The RI, RI Addendum, and FS reports, proposed plan, and other related documents were reviewed by the TRC.

support documents were all submitted to the TRC or RAB for their review and comment.

The Army, as part of its commitment to involve the affected communities, first when an installation closure involves transfer of property to the community. Devens RAB was formed in February 1994 to add members of the Citizen's Advisory Committee (CAC) to the TRC. The CAC had been established previously to address Massachusetts Environmental Policy Act/Environmental Assessment issues concerning the reuse of property at Fort Devens. The RAB consists of 28 members (15 TRC members plus 13 new members) who are representatives from the Army, US Region I, MADEP, local governments and citizens of the local communities. The RAB meets monthly and provides advice to the installation and regulatory agencies on cleanup programs. Specific responsibilities include: addressing cleanup land use and cleanup goals; reviewing plans and documents; identifying program requirements and priorities; and conducting regular meetings that are open to the public. The Army presented the proposed plan for the Shepley's Hill Landfill at the May 4, 1995 RAB meeting.

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

On May 31, 1995, the Army issued a fact sheet to citizens and organizations and the public with a brief explanation of the Army's preferred remedy for contaminated groundwater at the Shepley's Hill Landfill Operable Unit. The fact sheet describes the opportunities for public participation and provided details on the upcoming comment period and public meetings.

During the week of May 22, 1995, the Army published a public notice announcing the proposed plan, public informational meeting, and public hearing in the Times Free Press and the Lowell Sun. A public notice announcing the public hearing was published the week of June 12, 1995 in the Times Free Press and the week of June 19, 1995 in the Lowell Sun. The Army also made the proposed plan available to the public at information repositories at the libraries in Ayer, Shirley, Lancaster, and Fort Devens.

From June 1 to June 30, 1995, the Army held a 30-day public comment period for public comments on the alternatives presented in the FS and the proposed plan and other documents released to the public. On June 6, 1995, the Army held an informational meeting at Fort Devens to present the Army's proposed plan and to discuss the cleanup alternatives evaluated in the FS. This meeting provided an opportunity for open discussion concerning the proposed cleanup. On June 13, 1995, the Army held an informal public hearing at Fort Devens to discuss the proposed plan and to accept verbal or written comments from the public. A transcript of the public comments, and the Army's response to comments are included in the Responsiveness Summary (Appendix C).

All supporting documentation for the decision regarding the Shepley's Hill Landfill Operable Unit is contained in the Administrative Record for review. The Administrative Record is a collection of all the documents considered by the Army in choosing the remedy for the Shepley's Hill Landfill Operable Unit. On June 2, 1995, the Administrative Record was made available for public review at the Fort Devens Environmental Office, and at the Ayer Town Hall, Ayer, Massachusetts. An Administrative Record is available at the USEPA Records Center, 90 Canal Street, Boston, Massachusetts and is provided as Appendix D.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

IV. SCOPE AND ROLE OF THE RESPONSE ACTION

The Army developed the selected remedy by combining components of different control and management of migration alternatives. The selected remedy for Shepley's Hill Landfill Operable Unit controls the release of contaminants groundwater and controls potential groundwater use. The selected remedy a environmental monitoring of groundwater for a period of thirty years. The implementation of the selected alternative will not adversely affect any of actions at the Shepley's Hill Landfill Operable Unit should they be required.

This remedial action will address the principal threat to human health at Hill Landfill Operable Unit posed by long-term residential exposure to contaminated groundwater. Potential threats to human and ecological receptors resulting in exposure to contaminated sediments and surface water in Plow Shop Pond will be addressed as part of the Plow Shop Pond Operable Unit. Potential remedial Plow Shop Pond sediment contamination will be evaluated in a separate engineering report anticipated to be issued September 1, 1996. Environmental monitoring any continuing effect of the landfill on the pond will take place as part of the Plow Shop Pond Operable Unit.

V. SUMMARY OF SITE CHARACTERISTICS

Section 1 of the FS report contains an overview of RI and supplemental RI at Shepley's Hill Landfill. A complete discussion of site characteristics Sections 3, 5, and 6 of the RI report, April 1993, and Sections 3, 4, and Addendum report, December 1993. Significant findings of the RI and supplemental are summarized in the following subsections.

A. Soils

The RI at Shepley's Hill Landfill included collecting three surface soils suspected seep areas and analyzing them for Target Compound List (TCL) organic compounds, Target Analyte List (TAL) metals, and total organic carbon (TOC) concentrations of acetone and methylene chloride were reported in the sample however, they were attributed to laboratory contamination. No other organic

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

detected. Concentrations of TAL metals were within the estimated background except for calcium, which was elevated slightly. This was not considered because soil contamination was not identified during the RI, soils were not during the supplemental RI.

B. Groundwater

Assessment of groundwater quality included two rounds of sampling at 22 monitoring wells during the RI, and one confirming round of sampling at 27 monitoring wells during the supplemental RI. Target groups for the RI and supplemental RI field programs included VOCs, semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and inorganics.

The RI report concluded that groundwater downgradient of the landfill was contaminated with VOCs and inorganics as well as low concentrations of pesticides, and PCBs in scattered monitoring wells. The presence of pesticides was not confirmed, however, because of apparent laboratory contamination of several blanks. The PCB Aroclor-1260 was reported at a low concentration in only 22 samples in one sampling round. The SVOC di-ethylphthalate was reported at 32 parts per billion (ppb) in samples from two separate monitoring wells, considered a sampling artifact.

The RI Addendum report also concluded that downgradient monitoring wells were contaminated with several VOCs and inorganics. A total of nine VOCs were reported at low concentrations in seven of the monitoring wells. Organic compounds were most frequently and at the highest concentrations in the downgradient monitoring wells SHL-11, SHL-19, SHL-20, and SHM-93-10C along the eastern edge of the landfill. In two instances, concentrations exceeded federal Maximum Contaminant Levels (MCLs) for drinking water: total dichlorobenzenes were reported at 11 ppb (the MCL for 1,4-dichlorobenzene is 5 ppb) in monitoring well SHL-20, and the VOC 1,2-dichloroethane was reported at 5 ppb (MCL = 5 ppb) in monitoring well SHM-93-10C.

Inorganics were also reported at their highest concentrations in downgradient monitoring wells, especially SHL-10, SHL-11, SHL-19, SHL-20, and SHM-93-22C. Unfiltered groundwater samples from these wells were analyzed for a wide range of inorganic constituents.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

groundwater samples from downgradient monitoring wells typically exceeded concentrations for arsenic, calcium, iron, magnesium, manganese, and potassium. In addition, there were scattered exceedances of background concentrations for lead, vanadium, and zinc. The concentrations of arsenic ranged from 69 to 100 ppb (MCL = 50 ppb) in unfiltered samples from these monitoring wells. A significant portion of the total concentration of the inorganics was often associated with suspended material in the samples. An exception to this was the presence of dissolved arsenic in monitoring wells SHL-11, SHL-19, and SHL-20, all of which had high concentrations of arsenic in both filtered and unfiltered samples. Low oxidation potential with high dissolved arsenic concentrations was consistent with expected conditions downgradient of the landfill.

No pesticides or PCBs were reported in the supplemental RI groundwater sampling. The RI Addendum report to reinterpret groundwater data presented in the RI report. Although pesticides were reported at low concentrations in several RI sampling rounds, no monitoring well had pesticides detected in both RI sampling rounds. In addition, the RI report states that several pesticides including heptachlor, endrin, alpha-beta-benzenehexachloride, 2,2-bis(para-chlorophenyl)-1,1,1-trichloroethane, and endosulfan sulfate were detected in method blank samples, and that low concentrations of pesticides were detected in several monitoring wells.

of those compounds should be considered laboratory contamination. The RI noted difficulties with the pesticide and PCB analyses. These considerations and supplemental RI data support the conclusion that the landfill is not a source of PCBs in groundwater.

Supplemental RI data included the reported presence of the explosive nitrobenzene at one monitoring well, the water table monitoring well SHM-93-24A, at 80.8 pcf. This monitoring well is considered cross-gradient of the landfill and the source of nitrobenzene is not known. The landfill is not considered a source of nitrobenzene. Although the explosives 1,3,5-trinitrobenzene, 1,3-dinitrobenzene and tetrachloroethene were reported inconsistently and at low concentrations in RI samples, they were not in the supplemental RI samples. SVOCs were not identified as groundwater contaminants in the RI report or targeted as analytes during the supplemental RI program. They are not considered groundwater contaminants at Shepley's Hill.

C. Plow Shop Pond Surface Water

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

During the RI, samples were collected from 13 locations along the Plow Shop Pond shoreline to characterize surface water quality. Target analytes included VOCs and TAL metals. The VOCs chloroform and methylene chloride were reported in several samples, and the pesticide endrin was reported at a low concentration in one sample. Methylene chloride was considered a laboratory contaminant and the presence of endrin was not considered significant in the RI report. The presence of endrin was considered an improbable surface water contaminant in the RI report, could not be explained. The inorganics copper, silver, and zinc exceeded Ambient Water Quality Criteria (AWQC) for the protection of aquatic life throughout the pond, and zinc exceeded AWQC in the wetlands area north of the pond.

D. Plow Shop Pond Sediments

Plow Shop Pond is believed to have been a historical discharge area for groundwater passing beneath Shepley's Hill Landfill and to have received contamination from the landfill. Areas of iron staining have been observed in Plow Shop Pond adjacent to the landfill. The characterization of Plow Shop Pond sediments was accomplished both by the RI and supplemental RI. The RI report concluded that pond sediments were contaminated with high concentrations of TAL metals and low concentrations of polynuclear aromatic hydrocarbons. The VOCs acetone, methylene chloride, 2-butanone were reported in several samples, as were low concentrations of chlorophenyl-1,1-dichloroethene (DDE) and heptachlor. The presence of acetone, methylene chloride, and heptachlor is attributed to laboratory contamination.

Additional sediment samples were collected during the supplemental RI. The RI Addendum report concluded that sediments were contaminated with arsenic, barium, copper, chromium, iron, lead, manganese, mercury, nickel, and zinc. Based on data, manufacturing process chemicals, waste disposal practices, and chemical distribution patterns in Plow Shop and Grove ponds, the RI Addendum reported a former tannery located on Grove Pond as the major source of arsenic, chromium, and mercury. Shepley's Hill Landfill was identified as a primary source of barium, manganese, and nickel and a secondary source of arsenic, chromium, and lead. Data available at the time of the RI Addendum report were insufficient to define

of copper. Subsequently available data from the Grove Pond and Railroad R investigations suggest that activities at the tannery may have been a source of copper and activities at the roundhouse may have been a source of copper.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

The supplemental RI sampling confirmed the presence of 2,2-bis(para-chloro 1,1-dichloroethane (DDD), DDE, and DDT at low concentrations in Plow Shop sediments. Several chemicals exceeded sediment quality guidelines. The RI report did not identify the landfill as a source of the pesticides.

VI. SUMMARY OF SITE RISKS

The risk assessment contained in the RI Addendum report evaluates the probability of potential human health and environmental effects associated with exposure to contaminated media at the site and updates the risk assessment of the RI human health risk assessment followed a four step process: (1) contaminant identification, which identified those hazardous substances that, given the site, were of significant concern; (2) exposure assessment, which identified potential exposure pathways, characterized the potentially exposed population, and determined the extent of possible exposure; (3) toxicity assessment, which characterized the types and magnitude of adverse health effects associated with exposure to hazardous substances, and (4) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks. A detailed discussion of the health risk assessment approach and results is presented in Section 6 of the RI Addendum report and summarized in Subsection 1.4 of the FS report.

Forty contaminants of potential concern, listed in Tables 1 through 7 in Appendix A of this Record of Decision were selected for evaluation in the human health risk assessment of the RI Addendum report. These contaminants of concern were selected to represent potential site-related hazards based on toxicity, concentration, frequency and mobility and persistence in the environment. A summary of the health risk assessment for each of the contaminants of concern can be found in the risk assessment in Section 6 of the RI Addendum Report and associated appendices.

Potential human health effects associated with exposure to the contaminants of concern were estimated quantitatively or qualitatively through the development of hypothetical exposure pathways. These pathways were developed to reflect potential exposure to hazardous substances based on the present uses, potential future uses, and location of the site. The following is a brief summary of the exposure assessment:

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

evaluated; a more thorough description can be found in Subsection 6.1.2.2 of the RI Addendum report.

incidental ingestion of Plow Shop Pond surface water, and long-term consumption of Plow Shop Pond fish by recreational fishermen and families;

contact (dermal contact and incidental ingestion) with Plow Shop sediment by site visitors;

contact (dermal contact and incidental ingestion) with surface water swimmers in Plow Shop Pond; and

future residential use of groundwater (there is no current identified

Because the RI report did not identify human health or ecological risks for exceeding the target risk values, soils were not re-evaluated in the RI Addendum.

Excess lifetime cancer risks were determined for each exposure pathway by the exposure level with the chemical-specific cancer slope factor. Cancer risk factors have been developed by USEPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic chemicals. That is, the true risk is unlikely to be greater than the risk predicted. Risk estimates are expressed in scientific notation as a probability (e.g. 1×10^{-6}) and indicate (using this example), that an average individual is not likely to have a one in a million chance of developing cancer over 70 years as a result of related exposure to the compound at the stated concentration. Current USEPA considers carcinogenic risks to be additive when assessing exposure to multiple hazardous substances.

The hazard index was also calculated for each pathway as a measure of the non-carcinogenic health effects. A hazard quotient is calculated by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for non-carcinogenic health effects for an individual compound. RfDs have been developed by US EPA to protect sensitive individuals over the course of a lifetime and they reflect the exposure level that is likely to be without an appreciable risk of adverse health effects. RfDs are derived from epidemiological or animal studies and incorporate uncertainties.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

Factors to help ensure that adverse health effects will not occur. The hazard index is often expressed as a single value (e.g., 0.3) indicating the ratio of the exposure level to the RfD value (in this example, the exposure level is characterized as approximately one third of an acceptable exposure level for the given compound). A hazard quotient is only considered additive for compounds that have the same toxic endpoint and the sum is referred to as the hazard index (HI). (For example, a hazard quotient for a compound known to produce liver damage should not be added to a second whose toxic endpoint is kidney damage).

The human health risk assessment of the RI Addendum report identifies the potential human health risks:

Future residential use of unfiltered groundwater interpreted to be influenced by the landfill and contaminated with several inorganic compounds (arsenic, manganese, chromium, lead, nickel, and sodium) and 1,2-dichloroethane and dichlorobenzenes was estimated to present

cancer risks of 4×10^{-4} to 8×10^{-3} . Most of the risk was due to arsenic. If a downward modifying factor of 10 is applied to this account for the uncertainty associated with arsenic risks, the estimate is 4×10^{-5} to 8×10^{-4} , still within or exceeding the Superfund risk range. Manganese presented average and maximum noncancer HI values of 12 to 55.

It should be noted that when present at the federal MCL for drinking water, arsenic presents an estimated cancer risk of 1×10^{-3} , which is within the target risk range, and an HI of 5.

Long-term consumption of fish from Plow Shop Pond presented cancer risks that ranged from 3×10^{-6} to 4×10^{-4} , within or exceeding the target risk range. Arsenic accounted for approximately 96 to 99 percent of the risk, while DDE contributed approximately 4 to 0.4 percent. Manganese presented noncancer risks that exceeded the target value of 1 (HI from 2 to 7). If a downward modifying factor of 10 is applied to the risk estimate to account for the uncertainty associated with arsenic, the modified risk estimate is 3×10^{-7} to 4×10^{-5} , which is within the Superfund target risk range. Thus it appears that the major human risk associated with Plow Shop Pond fish is due to mercury contamination.

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

Long-term contact with Plow Shop Pond sediment presented cancer risks of 2×10^{-5} to 2×10^{-4} and 9×10^{-5} to 6×10^{-4} under current and future exposure scenarios, respectively. Only under the maximum exposure assumption do the estimates exceed the target risk range. Arsenic was responsible for essentially 100 percent of the risk. If a downward modifying factor is applied to the cancer risk estimate to account for the uncertainty associated with arsenic risks, the modified risk estimates are 2×10^{-5} (current exposure scenario) and 9×10^{-6} to 6×10^{-5} (future exposure scenario), which are within or below the Superfund target risk range.

The ecological risk assessment evaluates risks to aquatic and semi-aquatic exposure to Plow Shop Pond surface water and sediments. Because the RI did not identify ecological risks for soils exceeding the target risk values, soils were not evaluated in the RI Addendum report. Exposure of ecological receptors to surface water was not evaluated because this was not considered a likely or significant pathway.

The ecological risk assessment predicted, based on comparison to reference sites, that Plow Shop Pond surface water and sediments present potential adverse risks to human receptors. Average and maximum HI values for aquatic receptor exposure to surface water were 7.7 and 12.8, respectively. Primary contributors to potential risk were silver, and zinc. For aquatic receptor exposure to sediments, average and maximum HI values were 182 and 1,300, respectively. Primary contributors to estimate risk were arsenic, chromium, manganese, and mercury. Other data, including fish and macroinvertebrate community studies, suggest that adverse effects may be less than predicted by the risk assessment.

For semi-aquatic wildlife, in both the average and maximum exposure scenarios, HI values were greater than 1 for five of the eight receptor species evaluated, including mallard duck, painted turtle, green frog, mink, and muskrat. For the great blue heron, HI values were less than 1.

the maximum exposure scenario but not the average exposure scenario exceed for the osprey and raccoon were well below 1. Sediments were predicted no present potential risks to species with small home ranges and direct contact with sediment, such as the green frog or painted turtle. Primary contributors were arsenic, chromium, manganese, and mercury.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

A detailed discussion of the ecological risk assessment approach and results is in Section 7 of the RI Addendum report and summarized in Subsection 1.5 of the report.

Actual or potential releases of hazardous substances to groundwater from the Landfill, if not addressed by implementing the response action selected in the Decision, may present an imminent and substantial endangerment to public health, welfare, and the environment.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. Statutory Requirements/Response Objectives

Under its legal authorities, the Army's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that the remedial action, when completed, comply with all federal and more stringent state environmental standards, criteria, or limitations, unless a waiver is invoked; a requirement that the action be cost-effective and use permanent solutions and alternative treatment and resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment permanently and significantly reduces the toxicity or volume of hazardous substances as a principal element. Response alternatives developed to be consistent with these Congressional mandates.

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial response objectives were developed to aid in the development and screening of alternatives. These response objectives were developed to mitigate existing and future potential threats to public health and the environment. The response objectives are:

Protect potential residential receptors from exposure to contaminants in groundwater migrating from the landfill having chemicals in excess of MCLs.

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

Prevent contaminated groundwater from contributing to the contamination

of Plow Shop Pond sediments in excess of human health and ecology risk-based concentrations.

Response objectives were not identified for surface soil, landfill gas, or risk assessments did not identify potential risks from exposure to surface ambient air monitoring during the RI did not identify airborne contaminant leachate was not identified during either RI or supplemental RI activities actions to manage risk from exposure to Plow Shop Pond surface water and s will be evaluated separately for the Plow Shop Pond Operable Unit.

B. Technology and Alternative Development and Screening

CERCLA and the National Oil and Hazardous Substances Pollution Contingency (NCP) set forth the process by which remedial actions are evaluated and in accordance with these requirements, a range of alternatives was developed for Shepley's Hill Landfill Operable Unit. The NCP reaffirms CERCLA's preference for permanent solutions that use treatment technologies to reduce the toxicity volume of hazardous substances to the maximum extent practical. With respect to source control, the in-situ treatment, or alternately the excavation and treatment of a large, heterogeneous landfill as Shepley's Hill Landfill is considered is not cost effective. Therefore, the FS for the Shepley's Hill Landfill Operable Unit developed a range of alternatives in which containment of wastes was the preferred element. This approach is consistent with guidance contained in the USEPA Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Solid Waste Sites, which states that the most practical remedial alternative for landfill waste is containment by capping. All of the alternatives (including the no action alternative) considered in the FS included containment of landfill waste by the existing geomembrane cover system. One alternative was based on installing a Resource Conservation and Recovery Act (RCRA) composite cover system on top of the existing geomembrane cover system.

With respect to groundwater, the FS developed several remedial alternative site-specific cleanup levels using different technologies and a no action alternative. Three candidate alternatives included slurry wall containment of groundwater, five included in-situ treatment of groundwater, five included groundwater extraction and discharge to treatment works, and one included groundwater extraction and discharge to treatment works.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

publicly owned treatment works (POTW). Except for the no action alternative, alternatives also included institutional controls, long-term maintenance, and environmental monitoring programs.

Section 3 of the FS identified, assessed, and screened technologies and processes based on implementability, effectiveness, and cost. In Section 4 of the FS, technologies and process options were combined into the ten candidate alternatives below.

- Alternative SHL-1: No Action
- Alternative SHL-2: Limited Action
- Alternative SHL-3: Containment/Collection/Short-term Ex Situ Treatment/Surface Water Discharge
- Alternative SHL-4: Containment/In Situ Treatment
- Alternative SHL-5: Collection/Ion Exchange Treatment/Surface Water

Alternative SHL-6: Collection/Chemical Precipitation Treatment
Water Discharge
Alternative SHL-7: Collection/Constructed Wetland Treatment/Surface
Discharge
Alternative SHL-8: Groundwater Barrier/In Situ Oxidation
Alternative SHL-9: Collection/Discharge to POTW
Alternative SHL-10: Installation of RCRA Cap

Each alternative was then evaluated and screened in Section 4 of the FS based on implementability, effectiveness, and cost, as described in Section 300.430 NCP, to narrow the number of potential remedial alternatives for detailed analysis. From this screening process, five remedial alternatives were retained for analysis.

VIII. DESCRIPTION OF ALTERNATIVES

Of the 10 alternatives identified in the FS, five were discarded during this step, and the remaining five were evaluated in detail. A detailed assessment of each alternative can be found in Section 5 of the FS report. This section provides a summary of each of the following five alternatives evaluated in detail in

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

Alternative SHL-1: No Action
Alternative SHL-2: Limited Action
Alternative SHL-5: Collection/Ion Exchange Treatment/Surface Water
Alternative SHL-9: Collection/Discharge to POTW
Alternative SHL-10: Installation of RCRA Cap

A. Alternative SHL-1: No-Action

The No Action alternative does not contain any remedial action components. The existing landfill cover system to reduce or control potential risks. No additional controls would be implemented to prevent future human exposure, and existing systems to maintain existing systems and monitor for potential future releases would be maintained. Alternative SHL-1 is developed to provide a baseline for comparison with the other remedial alternatives.

Estimated Time for Restoration:	not applicable
Estimated Capital Cost:	\$0
Estimated Operation and Maintenance Cost: (net present worth)	\$0
Estimated Total Cost: (net present worth, assuming 5% discount rate)	\$0

B. Alternative SHL-2: Limited Action

Alternative SHL-2 contains components to maintain and potentially improve the effectiveness of the existing landfill cover system and to satisfy the Land Use Requirements of 310 CMR 19.142 to reduce potential future exposure to contaminated groundwater. Key components of this alternative include:

landfill closure in accordance with applicable requirements of 3
19.000;
survey of Shepley's Hill Landfill;
evaluation/improvement of stormwater diversion and drainage;
landfill cover maintenance;
landfill gas collection system maintenance;

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

long-term groundwater monitoring;
long-term landfill gas monitoring;
institutional controls;
educational programs;
60 percent design of a groundwater extraction system;
annual reporting to MADEP and USEPA; and
five-year site reviews.

Estimated Time for Restoration: Approximately 12 months for engine
evaluations, design, and construction.

Estimated Capital Cost: \$ 928,000

Estimated Operation and Maintenance Cost:
(net present worth) \$1,291,000

Estimated Total Cost: (net present worth,
assuming 5% discount rate) \$2,219,000

C. Alternative SHL-5: Collection/Ion Exchange Treatment/Surface Water

Alternative SHL-5 consists of components that, together with the component
Alternative SHL-2, would provide additional controls to prevent off-site m
contaminated groundwater. Key components of Alternative SHL-5 include:

landfill closure in accordance with applicable requirements of 3
19.000;
design, construction, operation, and maintenance of groundwater
extraction, treatment, and discharge facilities;
survey of Shepley's Hill Landfill;
evaluation/improvement of stormwater diversion and drainage;
landfill cover maintenance;
landfill gas collection system maintenance;
long-term groundwater monitoring;
long-term landfill gas monitoring;
institutional controls;
educational programs;
annual reporting to MADEP and USEPA; and
five-year site reviews.

W0099518.080

Fort Devens,

The major difference between Alternative SHL-5 and Alternative SHL-2 is the construction and operation of groundwater extraction, treatment, and discharge facilities. Data collected during predesign studies would be used to optimize the size of groundwater extraction wells at Shepley's Hill Landfill. Contaminated groundwater would be treated in an on-site groundwater treatment facility that (subject to further studies) includes carbon adsorption, sand filtration, and ion exchange treatment. The treated effluent would be discharged through an effluent pipeline to Nonacoicus Brook.

Estimated Time for Restoration: Approximately 18 months for predesign, design, and construction. Groundwater extraction and treatment would continue for a minimum of 30-years.

Estimated Capital Cost: \$2,577,000

Estimated Operation and Maintenance Cost: (net present worth) \$6,549,000

Estimated Total Costs: (net present worth, assuming 5% discount rate) \$9,126,000

D. Alternative SHL-9: Collection/Discharge to POTW

Alternative SHL-9 adds the components of groundwater extraction and discharge facilities to Alternative SHL-2 to provide additional control to prevent off-site migration of contaminated groundwater. Key components of Alternative SHL-9 include:

- landfill closure in accordance with applicable requirements of 304 and 305 of the Clean Water Act;
- design, construction, operation, and maintenance of groundwater extraction and discharge facilities;
- survey of Shepley's Hill Landfill;
- evaluation/improvement of stormwater diversion and drainage;
- landfill cover maintenance;
- landfill gas collection system maintenance;
- long-term groundwater monitoring;
- long-term landfill gas monitoring;
- institutional controls;
- educational programs;

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

annual reporting to MADEP and USEPA; and
five-year site reviews.

The major difference between Alternative SHL-9 and Alternative SHL-2 is the construction and operation of groundwater extraction and discharge facilities. Data collected during predesign studies would be used to optimize the size and location of groundwater extraction wells at Shepley's Hill Landfill. Following construction of groundwater extraction facilities, contaminated groundwater would be pumped to a discharge manhole anticipated to be located on Scully Road near the north side of the landfill. There, the groundwater would combine with domestic wastewater and be discharged to the Town of Ayer POTW for treatment and subsequent discharge. The Ayer POTW

with a capacity of 1.79 million gallons per day (MGD), would be able to handle additional anticipated volume of 20 to 30 gallons per minute (0.029 to 0.0

Review of available groundwater monitoring data suggests that pretreatment groundwater will not be needed to meet existing pretreatment standards established by the Town of Ayer. The Army would monitor the groundwater discharge to the town, however, and if necessary install pretreatment facilities to meet pretreatment standards. The Army would pay a sewer user fee to the town based on the volume of wastewater discharged to the POTW.

Estimated Time for Restoration: Approximately 15 months for pre-design, design, and construction. Groundwater extraction and discharge to POTW as required for a minimum of 30-years.

Estimated Capital Cost:	\$1,184,000
Estimated Operation and Maintenance Cost: (net present worth)	\$2,690,000
Estimated Total Cost: (net present worth, assuming 5% discount rate)	\$3,874,000

E. Alternative SHL-10: Installation of RCRA Cap

Alternative SHL-10 consists of building a new landfill cover system on top of the existing cover system at Shepley's Hill Landfill. The new cover system would be designed to meet RCRA performance criteria and design guidance for hazardous waste landfills. The principal component of the new cover system would be a 24-inch layer of

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

permeability soil in intimate contact with a geomembrane. Maintenance activities, monitoring and reporting requirements, and institutional controls would be those of Alternative SHL-2.

Estimated Time for Restoration:	Approximately three years required and construction.
Estimated Capital Cost:	\$19,645,000
Estimated Operation and Maintenance Cost: (net present worth)	\$ 1,291,000
Estimated Total Cost: (net present worth, assuming 5% discount rate)	\$20,936,000

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that at a minimum the Agency is required to consider in its assessment of alternatives. Building upon the statutory mandates, the NCP articulates nine evaluation criteria to be used to select the individual remedial alternatives. The nine criteria are used to select the alternative that best meets the goals of protecting human health and the environment, maintaining the site over time, and minimizing untreated waste.

A detailed analysis was performed on the alternatives using the nine evaluation criteria to select a site remedy. Specific discussion regarding this analysis is provided in Section 5 of the FS report. Definitions of the nine criteria are provided below:

Threshold Criteria

The two threshold criteria described below must be met in order for alternative to be eligible for selection in accordance with the NCP

Overall Protection of Human Health and the Environment - Assesses well an alternative, as a whole, achieves and maintains protective health and the environment.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) - Assesses how the alternative complies with location-, and action-specific ARARs, and whether a waiver is required or justified

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

Primary Balancing Criteria

The following five criteria are used to compare and evaluate the element alternatives that meet the threshold criteria.

Long-Term Effectiveness and Permanence - Evaluates the effectiveness of the alternative in protecting human health and the environment and whether response objectives have been met. This criterion includes consideration of the magnitude of residual risks and the adequacy and reliability of the response.

Reduction of Toxicity, Mobility, and Volume Through Treatment - Evaluates the effectiveness of treatment processes used to reduce toxicity, mobility, and volume of hazardous substances. This criterion considers the degree to which treatment is irreversible, and the type and quantity of residuals remaining after treatment.

Short-Term Effectiveness - Examines the effectiveness of the alternative in protecting human health and the environment during the construction and implementation of a remedy until response objectives have been met. Considers the protection of the community, workers, and the environment during implementation of remedial actions.

Implementability - Assesses the technical and administrative feasibility of an alternative and availability of required goods and services. This criterion considers the ability to construct and operate a remedy, its reliability, the ease of undertaking additional remedial actions, the ability to monitor the effectiveness of a remedy. Administrative considerations include the ability to obtain approvals from other parties or agencies and the extent of required coordination with other parties or agencies.

Cost - Evaluates the capital, and operation and maintenance costs of the alternative.

Modifying Criteria

W0099518.080

The modifying criteria are used on the final evaluation of remedial generally after the Army has received public comments on the FS and plan.

State Acceptance - This criterion considers the state's preferences or concerns about the alternatives, including comments on ARARs proposed use of waivers.

Community Acceptance - This criterion considers the communities preferences among or concerns about the alternatives.

Following the detailed analysis of each individual alternative, the Army comparative analysis, focusing on the relative performance of each alternative criteria. This comparative analysis of the five alternatives is presented in the FS report and summarized below.

A. Overall Protection of Human Health and the Environment

This criterion addresses how an alternative as a whole will protect human environment. This includes an assessment of how public health and environmental risks posed through each pathway are eliminated, reduced, or controlled through engineering controls, or institutional controls. According to CERCLA, this must be met for a remedial alternative to be chosen as a final site remedy.

At Shepley's Hill Landfill, the existing cover system isolates landfill materials from the environment, blocks infiltration, and based on computer modeling, diverts that would otherwise discharge to Plow Shop Pond. Historical groundwater monitoring between the landfill and Plow Shop Pond has shown analyte concentrations in excess of cleanup levels; however, no current residential exposure to groundwater has been identified, and the existing cap prevents infiltration of contaminants into the downgradient of the landfill. Alternatives SHL-1, SHL-2, SHL-5, and SHL-9 which rely on the existing cover to isolate waste, prevent infiltration, and prevent groundwater discharge to the pond, are considered equally protective of human health under current exposure scenarios. Alternative SHL-10, which proposes to replace the existing geomembrane cover with a composite cover, would not afford significantly greater protection under current conditions.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

Differences in protectiveness may exist under future exposure conditions. SHL-1 proposes no action to prevent future residential exposure to groundwater and to maintain and monitor the long-term performance of the existing cover. The alternatives all propose to implement zoning and deed restrictions to prevent residential exposure to groundwater and to maintain and monitor long-term performance. Once installed, the composite cover system proposed for Alternative SHL-10 would be newer and therefore potentially provide protection longer than the existing cover. However, its protectiveness at any given time would not be greater than the anticipated performance of the existing cover. In addition,

site reviews proposed for all alternatives provide the opportunity to implement remedial actions if they are needed. The installation of a composite cover system could be considered in the future if the existing cover system does not perform. Alternatives SHL-5 and SHL-9, in addition to their reliance on the existing cover system, propose to extract contaminated groundwater for subsequent treatment and disposal. They therefore provide some redundancy or backup to achieve cleanup levels if the existing cover system does not perform as anticipated.

There is no ecological exposure to groundwater. Reductions in infiltration coupled with the diversion of groundwater that would otherwise discharge to the Pond will provide protection of the environment. The potential difference in the effectiveness of the evaluated alternatives at protecting the environment is the differences discussed for future protection of human health.

B. Compliance with Applicable or Relevant and Appropriate Requirements

This criterion addresses whether a remedy complies with all state and federal environmental and public health laws and requirements that apply or are relevant to the conditions and cleanup options at a specific site. If a remedy cannot meet an ARAR, the analysis of the alternative must provide the rationale for invoking a statutory waiver.

Location-specific ARARs identified for the Shepley's Hill Landfill include regulations that protect wetlands, floodplains, and endangered species (i.e., Grasshopper Sparrow, a state listed species of special concern). Alternatives SHL-2, and SHL-9 would not involve any activities anticipated to trigger wetland or floodplain ARARs. Alternative SHL-5 would require construction of a discharge

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

pipeline to Nonacoicus Brook and may trigger wetland and floodplain ARARs. Activities for all alternatives would be conducted or altered to comply with wetland and floodplain ARARs. All of the alternatives would be subject to ARARs protecting endangered species. Activities performed for any of the alternatives would prevent or minimize adverse effects on the Grasshopper Sparrow and its habitat. In spite of this, implementation of Alternative SHL-10 would result in destruction of nesting areas of the Grasshopper Sparrow that might exist at the landfill.

Alternatives SHL-1, SHL-2, and SHL-10 rely on cover system performance to comply with chemical-specific ARARs and cleanup levels. Currently groundwater at the northern end of the landfill meets cleanup levels, and landfill capping is intended to reduce leaching of landfill materials and the resulting groundwater contamination thereby achieving cleanup levels along the eastern edge of the landfill. SHL-5 and SHL-9 would comply with chemical-specific ARARs and cleanup levels by using a combination of landfill capping and groundwater extraction. Groundwater cleanup levels would be extracted and treated or disposed of before exiting the landfill.

Several action-specific ARARs have been identified for the Shepley's Hill Operable Unit; the most important are the ones relating to landfill cover and landfill closure. The Massachusetts Solid Waste Management Regulations at 19.000 have been identified as applicable. USEPA Regulations for Owners and Operators of Permitted Hazardous Waste Facilities at 40 CFR 264 (RCRA Subpart D) and USEPA Criteria for Municipal Solid Waste Landfills at 40 CFR 258 (RCRA Part D), and Massachusetts Hazardous Waste Management Rules at 310 CMR 30.000 have

all been identified as relevant and appropriate.

The design of the existing cover system at Shepley's Hill Landfill was approved by the Massachusetts Department of Environmental Protection (MADEP) in 1985 pursuant to the Massachusetts Sanitary Landfill regulations (310 CMR 19.00). Provisions in the Massachusetts Solid Waste Management Regulations of 1990 (310 CMR 19.000) indicate that the conditions of the landfill must satisfy 310 CMR 19.000; therefore the existing cover is considered to comply with applicable cover system requirements of 310 CMR 19.000. In addition, the existing cover meets the general performance standards of 310 CMR 19.000. The existing cover also meets the performance standards of RCRA Subtitle C at 40 CFR 264.310, Subtitle D at 40 CFR 258, and Massachusetts Hazardous Waste Regulations at 30.000. The existing cover varies from USEPA guidance for RCRA final cover primarily in that it has a geomembrane hydraulic barrier rather than a composite

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

hydraulic barrier. Table 8 in Appendix B describes how the existing cover meets these performance standards. Alternatives SHL-1, SHL-2, SHL-5, and SHL-9, on the existing cover, will therefore comply with ARARs for cover systems. The system of Alternative SHL-10 would be designed to meet ARARs for cover systems as well as RCRA design guidance. The long-term monitoring and maintenance program for all alternatives except Alternative SHL-1 would be designed to comply with applicable requirements of 310 CMR 19.000.

Action-specific ARARs for landfill post-closure requirements would be met by all alternatives except Alternative SHL-1. Alternative SHL-5 would be required to obtain a substantive requirements of a federal National Pollutant Discharge Elimination Act (NPDES) permit to discharge treated groundwater to Nonacoicus Brook. These alternatives would also be required to meet ARARs for disposal of filter cake regeneration concentrate from groundwater treatment and to meet substantive requirements of a U.S. Army Corps of Engineers permit, a MADEP license, an Massachusetts water quality certification to construct a discharge pipeline to Nonacoicus Brook. Alternative SHL-9 would be required to meet the federal Clean Water Act General Pretreatment Requirements to discharge to the Town of Ayer POTW. All other alternatives would be required to meet state air quality regulations. All other techniques would be used, when necessary, for Alternatives SHL-5, SHL-9, and SHL-10 to meet air quality regulations.

C. Long-term Effectiveness and Permanence

This refers to the ability of an alternative to maintain reliable protection of human health and the environment over time once the cleanup levels have been met.

Alternative SHL-1 provides no controls or treatment beyond the existing cover to protect human health and the environment. Alternatives SHL-2 and SHL-10 rely on the effectiveness of a landfill cover system to achieve the remedial action objectives. Other alternatives use groundwater extraction and treatment in addition to the cover system to achieve remedial action objectives. All of the alternatives except SHL-1 include landfill post-closure and long-term groundwater monitoring to evaluate long-term effectiveness. All the alternatives except SHL-1 include institutional controls that require cooperation by private parties and government to be reliable and effective.

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

Alternatives SHL-5 and SHL-9 would use data obtained from the pre-design hydrogeological investigation to design a groundwater extraction system. allow design of an extraction system that is effective in capturing contam groundwater. However, groundwater extraction would not prevent landfill w its leachate from potentially contaminating the underlying aquifer; these on the cover system as discussed earlier.

D. Reduction of Toxicity, Mobility, and Volume through Treatment

This criterion is a principal measure of the overall performance of an alt 1986 amendments to the Superfund statute emphasize that, whenever possible should be selected that uses a treatment process to reduce permanently the contaminants at the site, the spread of contaminants away from the source contamination, and the volume or amount of contamination at the site.

Alternatives SHL-1, SHL-2, and SHL-10 do not meet the statutory preference treatment under CERCLA since these alternatives do not treat contaminants in groundwater or wastes at the site. Landfill capping which is a part of alternatives will reduce infiltration and the resulting leaching of contam reducing contaminant mobility.

Alternatives SHL-5 and SHL-9 meet the CERCLA statutory preference for trea These alternatives would reduce the mobility of contaminants by extracting groundwater for treatment or disposal. The removal of contaminants from g in Alternative SHL-5 would generate concentrated waste streams that would disposal. Alternative SHL-9 would discharge extracted groundwater to the POTW. The POTW generates sludge from treating influent water which would disposal.

E. Short-term Effectiveness

This refers to the likelihood of adverse effects on human health or the en may be posed during the construction and implementation of an alternative goals are achieved.

W0099518.080

DECISION SUMMARY
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

Alternatives SHL-1 and SHL-2 would have the least likelihood for adverse e implementation because no intrusive activities would be required. Alterna would have the least effect during implementation because it would not inv construction or operation. Alternatives SHL-5 and SHL-9 involve installat extraction wells and underground piping. A Health and Safety Plan would b during performance of these activities and during environmental monitoring the risk of site hazards to workers. Alternative SHL-5 would require tran treatment residuals and adherence to RCRA and U.S. Department of Transport regulations to minimize potential risks to workers.

Site activities would be performed to minimize effects on the Grasshopper its habitat. Maintenance schedules for Alternatives SHL-2, SHL-5, and SHL prepared to limit activities during the nesting season. Construction sche Alternatives SHL-5 and SHL-9 would be prepared to limit activities during season to avoid direct effects on the bird. Alternative SHL-10 would dest areas of the Grasshopper Sparrow that might exist at the landfill.

F. Implementability

Implementability refers to the technical and administrative feasibility of including the ease of construction and operation; administrative feasibili availability of services, equipment, and materials to construct and operat Also evaluated is the ease of undertaking additional remedial actions.

Post-closure requirements included in all of the alternatives present no i problems. Equipment and services required for monitoring and maintenance available. Zoning and deed restriction (i.e., institutional controls) inc alternatives, except SHL-1, could be easily implemented by the Army. Enfo the Town of Ayer would be required.

Groundwater extraction systems used in Alternatives SHL-5 and SHL-9 would designed and constructed. Many engineering companies are qualified to des install extraction systems. The treatment system proposed for Alternative sand filtration, carbon adsorption, and ion exchange, all of which are pro with vendors available. Alternative SHL-9 would require a long-term disch agreement between the Army and the Town of Ayer POTW as part of its

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

implementation. Initial discussions with representatives from the Town of indicate a willingness to consider accepting the discharge. Many engineer construction companies are qualified to design and install the cover syste SHL-10.

Alternative SHL-1 would be the easiest alternative to implement at the sit have the least effect on future remedial actions.

G. Cost

Cost includes the capital (up-front) cost of implementing an alternative a operating and maintaining the alternative over the long term, and net pres both capital and operation and maintenance costs.

A comparison of the estimated total present worth costs (based on a 5 perc rate) for each alternative evaluated in detail is presented in the followi

Alternative	Total Capital	Total O&M (net present worth)	Tota pres
SHL-1	\$ 0	\$ 0	
SHL-2	\$ 928,000	\$ 1,291,000	

SHL-5	\$ 2,577,000	\$ 6,549,000
SHL-9	\$ 1,184,000	\$ 2,690,000
SHL-10	\$ 19,645,000	\$ 1,291,000

Capital, operation and maintenance, and present worth costs for each alternative calculated with an estimated accuracy of -30 percent to +50 percent. The alternatives with the lowest capital costs are those that include the least amount of construction as Alternatives SHL-1, SHL-2, and SHL-9. Alternatives SHL-5 and SHL-10, which involve greater amounts of construction, require larger capital investment.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

Operation and maintenance costs are estimated on an annual basis, and are provided for Alternative SHL-1, which does not provide any long-term maintenance or monitoring. Operation and maintenance costs for Alternatives SHL-2, SHL-5, SHL-9, and SHL-10 include environmental monitoring for 30 years. Alternative SHL-5 includes the groundwater extraction, treatment and discharge systems, while Alternative SHL-10 includes operation of groundwater extraction and discharge systems and groundwater monitoring for the estimated duration of treatment.

H. State Acceptance

This criterion addresses whether, based on its review of the RI, RI Addendum, proposed plan, the state concurs with, opposes, or has no comment on the alternative the Army is proposing as the remedy for the AOCs. The Commonwealth of Massachusetts has reviewed the RI, RI Addendum, FS, proposed plan, and this Record of Decision and concurs with the selected remedy.

I. Community Acceptance

This criterion addresses whether the public concurs with the Army's proposed remedy. Comments were received from the community during the public comment period. The Army believes this shows community acceptance of the proposed plan and selected remedy.

X. THE SELECTED REMEDY

The selected remedy to address groundwater contamination at the Shepley's Hill Operable Unit is Alternative SHL-2: Limited Action, with Alternative SHL-10 as a contingency remedy if Alternative SHL-2 proves not to be protective. Each alternative includes components for the containment of landfill wastes and prevention of contaminant migration. The remedial components of the selected remedy are described in detail below.

W0099518.080

DE
Shepley's Hill Landfill

A. Groundwater Cleanup Levels

Groundwater cleanup levels for the Shepley's Hill Landfill Operable Unit were developed following the USEPA guidance documents entitled, Risk Assessment for Superfund: Volume 1 - Human Health Evaluation Manual (Part B, Develop Based Preliminary Remediation Goals), Interim, December 1991, and OSWER Di 9355.0-30, Role of the Baseline Risk Assessment in Superfund Remedy Select. The first step in developing cleanup levels for protection of human health was to identify those environmental media that in the baseline risk assessment presented a cumulative current or future cancer risk greater than 1×10^{-4} or a cumulative noncarcinogenic HI greater than 1, based on reasonable maximum exposure as the next step was to identify chemicals of concern within the media presenting risks greater than 1×10^{-6} or a hazard quotient greater than 1. This approach identified dichlorobenzenes, 1,2-dichloroethane, arsenic, and manganese as chemicals of concern in groundwater. In addition, the baseline risk assessment identified the following chemicals of concern as exceeding MCLs or MMCLs: dichlorobenzenes, 1,2-dichloroethane, arsenic, chromium, and nickel. Concentrations of lead in groundwater exceeded the federal drinking water action level. Concentrations of aluminum and iron exceeded risk based federal and Massachusetts Secondary MCLs, while sodium exceeded federal and Massachusetts guidelines for individuals on a sodium restricted diet.

With the exception of manganese, groundwater cleanup levels for chemicals were established based on MCLs and MMCLs. No MCL or MMCL has been established for manganese. The cleanup level for manganese was based on background concentrations because background concentrations exceeded the risk-based concentration derived from the available RfD value (5×10^{-3} milligrams/kilograms/day). Background concentrations for aluminum and iron exceeded their respective guideline values, cleanup levels for them were set at the background value. The cleanup level for sodium was set equal to the federal health advisory. The following table lists the cleanup levels for Shepley's Hill Landfill Operable Unit groundwater.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

Chemical of Concern	Cleanup Level, $\mu\text{g/L}$	Selection Basis
Arsenic	50	MCL
Chromium	100	MCL
1,2-Dichlorobenzene	600	MCL
1,4-Dichlorobenzene	5	MMCL
1,2-Dichloroethane	5	MCL
Lead	15	Action Level
Manganese	291	Background
Nickel	100	MCL
Sodium	20,000	Health Advisory
Aluminum	6,870	Background
Iron	9,100	Background

Attainment of cleanup levels in groundwater will result in an approximate reduction in potential human health risk, reflecting the approximate eight fold reduction in arsenic concentrations needed to attain the arsenic cleanup level. Records indicate that many skin tumors arising from oral exposure to arsenic are non-melanocytic.

that the dose-response curve for the skin cancers may be sublinear (in which cancer slope factor used to generate risk estimates may be overestimated). USEPA policy to manage these risks downward by as much as a factor of ten. result, the carcinogenic risk for arsenic at Shepley's Hill Landfill Opera managed as if it were one order or magnitude lower than the calculated risk residual human health risk from residential exposure to groundwater after cleanup levels is estimated to be approximately 1×10^{-3} (unmodified to account for uncertainty associated with arsenic) and 1×10^{-4} if modified to account for uncertainty associated with exposure to arsenic.

B. Description of Remedial Components

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

Alternative SHL-2 contains components to maintain and potentially improve effectiveness of the existing landfill cover system and to satisfy the Land Requirements of 310 CMR 19.142 to reduce potential future exposure to contaminated groundwater. Key components of this alternative include:

- landfill closure in accordance with applicable requirements of 310 CMR 19.000;
- survey of Shepley's Hill Landfill;
- evaluation/improvement of stormwater diversion and drainage;
- landfill cover maintenance;
- landfill gas collection system maintenance;
- long-term groundwater monitoring;
- long-term landfill gas monitoring;
- institutional controls;
- educational programs;
- 60 percent design of a groundwater extraction system;
- annual reporting to MADEP and USEPA; and
- five-year site reviews.

Each of these components is described in the following paragraphs.

Landfill Closure in Accordance with Applicable Requirements of 310 CMR 19.000. Commonwealth of Massachusetts regulations at 310 CMR 19.000 contain requirements for the submittal to, and approval by, MADEP of plans and supporting material documents that landfill closure occurs according to approved plans and applicable MADEP requirements. The Army submitted a draft closure plan for Shepley's Hill Landfill to MADEP on July 21, 1995 pursuant to 310 CMR 19.000; however, the landfill will not be officially closed until MADEP approves the documents. Review and official closure of the landfill by MADEP was anticipated prior to signature of Record of Decision. The Army will coordinate the finalization and submittal and support materials to MADEP to achieve official landfill closure.

Survey of Shepley's Hill Landfill. Prior to design and implementation of actions at Shepley's Hill Landfill, an accurate topographic survey of the landfill is required. No survey has been done since completion of the last phase of landfill capping. The estimated cost of this alternative includes an aerial survey of the landfill. It also includes the costs to survey the elevation and horizontal

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

monitoring wells or piezometers installed as part of remedial alternative and to prepare record drawings.

Evaluation/Improvement of Stormwater Diversion and Drainage. Stormwater d and drainage systems at and adjacent to Shepley's Hill Landfill will be ev of this alternative. Modifications for improvement will be implemented if shows they would be practical and cost-effective. The evaluation will foc following items of concern:

landfill cap runoff patterns and drainage ditch flow capacities;

potential run-under along the western edge of the landfill, part where the existing geomembrane cap may not have a good seal with underlying bedrock; and

the effectiveness of stormwater drainage systems upgradient of t (i.e., at the transfer station, tire recycling station, DRMO yar Market Street) at diverting run-off from potential infiltration upgradient of the landfill.

Detailed plans for evaluating stormwater diversion and drainage would be d during the alternative's design phase and submitted for regulatory agency concurrence.

Landfill Cover Maintenance. A small area of ponded water in the northwest of the landfill would be drained and regraded to minimize stress on the co prevent future ponding and potential for leakage through the PVC geomembra area is approximately 100 feet in diameter and is estimated to be about 1 The water would be pumped out and the ponded area backfilled with common b bring the area up to the desired grade. A new section of PVC geomembrane installed on top of the fill and seamed to the existing geomembrane cap to permeability surface in this area.

At the northern end of the landfill, erosion of cover soil in sections of swales has occurred in the past, exposing PVC geomembrane. This erosion h repaired, but may require additional repair in the future.

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

Annual inspections are proposed to monitor the condition of the landfill c Shepley's Hill Landfill, including monitoring wells, cover surface, and dr decide if maintenance is needed. Grass will be mowed annually and the cov as required. Landfill maintenance and mowing would be scheduled to minimi potential adverse effects to the Grasshopper Sparrow, a state-listed speci concern that may nest on the cover.

Detailed plans for landfill cover maintenance would be developed during th

alternative's design phase and submitted for regulatory agency review and

Landfill Gas Collection System Maintenance. Annual inspections are proposed to monitor the Shepley's Hill Landfill gas collection system and provide any repairs.

Long-term Groundwater Monitoring. Groundwater monitoring is proposed to monitor groundwater quality at Shepley's Hill Landfill and to assess future environmental conditions. Based on the hydrogeologic interpretation and analytical data presented in the Addendum report, the FS report presents proposed monitoring locations and parameters for a conceptual long-term groundwater monitoring program. The conceptual plan includes installation of three new monitoring wells at the landfill to create nested triplets of shallow/water table, mid-depth, overburden monitoring wells at SHL-9/SHL-22 and SHL-5. The monitoring wells are included in the conceptual program and would be sampled semi-annually for 30 years, consistent with 310 CMR 19.142. Table 5-3 of the FS report presents proposed monitoring locations and analytical parameters for a conceptual long-term groundwater monitoring program.

Detailed plans for long-term groundwater monitoring would be developed during the alternative's design phase and submitted for regulatory agency review and

Long-term Landfill Gas Monitoring. As part of post-closure monitoring activities, landfill gas will be monitored quarterly at landfill gas vents and analyzed using direct-reading instruments for lower explosive limit and total organic gas. Gas samples will be collected from the two vents with the highest field measurements and analyzed for TCL VOCs. These samples will be collected and analyzed in accordance with USEPA Method TO 14. Detailed plans for landfill gas monitoring would

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

developed during the alternative's design phase and submitted for regulatory review and concurrence.

Institutional Controls. Institutional controls are proposed in the form of deed restrictions for any property released by the Army at Shepley's Hill Landfill. The Fort Devens Preliminary Reuse Plan North Posts has proposed that Army land bordering Plow Shop Pond be zoned for open space and rail-related uses. By pre-empting residential use, these controls would limit human exposure. In addition, the Army would place deed restrictions on area property to prohibit installation of drinking water wells. This, in conjunction with landfill capping and long-term groundwater monitoring, would protect potential receptors from risks resulting from exposure to contaminated groundwater. Institutional controls would be drafted, implemented, and enforced in cooperation with state and local government.

Educational Programs. Periodic public meetings and presentations would be held to increase public awareness. This would help keep the public informed of the status, including both its general condition and remaining contaminant levels. This would be accomplished by conducting public meetings every five years coincident with five-year site reviews for Shepley's Hill Landfill. The presentation would include monitoring activities and the results of monitoring programs.

60 Percent Design of a Groundwater Extraction System. The Army will conduct

predesign hydrogeologic studies and prepare a 60 percent complete engineer for groundwater extraction and discharge to the Town of Ayer POTW. Predes may include installation of several additional piezometers in and around t collection of additional groundwater elevation data, and updating/refining groundwater model. Detailed plans for monitoring the piezometers will be part of the long-term groundwater monitoring plan. The 60 percent complet engineering design will begin in 1996 and be completed before the first fi review, scheduled for 1998.

Annual Reporting to MADEP and USEPA. Reports which would include a descri of site activities and a summary of results of environmental monitoring wo submitted annually to MADEP and USEPA. This reporting would satisfy the requirements of 310 CMR 19.132 and 19.142.

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

Five-year Site Reviews. Under CERCLA 121c, any remedial action (or lack t that results in contaminants remaining on-site must be reviewed at least e During five-year reviews, an assessment is made of whether the implemented protective of human health and the environment and whether the implementat additional remedial action is appropriate.

The five-year site reviews for Alternative SHL-2 will evaluate the alterna effectiveness at reducing potential human health risk from exposure to gro at preventing groundwater from contributing to Plow Shop Pond sediment con in excess of human health and ecological risk-based values. These evaluat based on how successful the alternative is at attaining cleanup levels at in two distinct monitoring well groups. Well Group 1 consists of wells, p north end of the landfill, where cleanup levels have been attained histori Group 2 consists of wells where historically cleanup levels have not been

The goal of Alternative SHL-2 is to maintain groundwater quality below cle at Group 1 wells, and to attain cleanup levels at Group 2 wells. Since gr quality historically attains cleanup levels in Group 1 wells, Alternative considered effective with regard to these wells if five-year site reviews condition is maintained.

Evaluating effectiveness at Group 2 wells is less straightforward. Instal geomembrane cap over the most upgradient areas at Shepley's Hill Landfill the Phase IV-B closure) was not completed until May 1993. Based on ground modeling, it is estimated that the average time needed for groundwater to these upgradient areas to downgradient wells SHL-11 and SHL-20 may be 10 t or longer. An equal or greater number of years may be needed for downgrad groundwater quality at these wells to attain cleanup levels. Overall grou is expected to improve and potential risk is expected to decrease during t although at some wells, certain chemicals may show small short-term increa concentration while other chemicals show decreases in concentrations and o reduced.

The Army proposes to use reduction of risk rather than reduction of concen measure of progress toward attainment of cleanup levels because this appro on the cleanup of arsenic, which is the primary contributor to risk in the This approach prevents a situation in which failure to attain a concentrat

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

goal for a minor contributor to risk (e.g., 1,2-dichloroethane where a red ppb represents a 50 percent reduction in concentration exceeding the clean overshadows the achievement of 50 percent or greater reduction in the concentration of arsenic. In the Group 2 wells, a 50 percent reduction in the concentration approximates a 50 percent reduction in groundwater risk, while a 50 percent reduction in the concentration of 1,2-dichloroethane represents less than a 1 percent reduction in groundwater risk. Alternative SHL-2 will be considered effective with respect to Group 2 wells if five-year reviews show an ongoing reduction of potential human health risk from Group 2 wells and the ultimate attainment of cleanup levels by January 2008.

The specific criteria for evaluating the effectiveness of Alternative SHL-2 are set forth below. The criteria for both groups of wells must be met for the alternative to be considered effective.

Group 1 Wells. For Group 1 wells where analyte concentrations have attained cleanup levels, Alternative SHL-2 will be considered effective if the concentrations of individual chemicals within individual wells do not exceed statistically significant cleanup level exceedances. To determine significance, the Army will apply methods consistent with the regulations at 40 CFR 264.97, 40 CFR 258.53, and 310 CMR 30.663.

Group 2 Wells. For Group 2 wells where chemical concentrations have attained cleanup levels in the past, Alternative SHL-2 will be considered effective if a 50 percent reduction in the increment of risk between cleanup level concentrations for chemicals of concern within individual wells is achieved by January 1998, if an additional 25 percent (75 percent cumulative) is achieved by January 2003, and if cleanup levels are attained by January 2008.

The Army will apply methods consistent with the regulations at 40 CFR 264.97, 40 CFR 258.53, and 310 CMR 30.663 to estimate chemical concentrations at baseline. Analytical data collected during RI (August and December 1991) and supplementary (March and June 1993) activities will be used to estimate the baseline concentrations. A detailed approach would be developed during the design phase and submitted for regulatory agency review and concurrence.

A major consideration in assessing the protectiveness of Alternative SHL-2 is that additional remedial actions may be appropriate will be the basis on which

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

cleanup levels were set. The Army will implement the contingency remedy if the criteria are not met for any chemicals for which cleanup levels were based on 40 CFR 141) and for manganese. No MCL has been established for manganese. The cleanup level for manganese was based on background concentrations because background concentrations exceed the risk-based concentration derived from

available RfD value (5×10^{-3} milligrams/kilograms/day). This approach for cleanup levels and for evaluating the effectiveness of landfill closure is USEPA guidance contained in Risk Assessment Guidance for Superfund: Volume Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals), Interim, December 1991, and with 40 CFR 258.55.

The Army will not implement additional remedial actions under CERCLA if cleanup levels are not attained for aluminum and iron. The cleanup levels for aluminum and iron were based on background concentrations because dose/response values were not available.

Similarly, the Army will not implement additional remedial actions if the cleanup levels are not attained for sodium. The cleanup level for sodium was based on the health risk for individuals on a reduced sodium diet.

Estimated Time for Restoration:	Approximately 12 months for engine evaluations, design, and construction.
Estimated Capital Cost:	\$ 928,000
Estimated Operation and Maintenance Cost:	
(net present worth)	\$1,291,000
Estimated Total Cost: (net present worth, assuming 5% discount rate)	\$2,219,000

XI. STATUTORY DETERMINATIONS

The selected remedy for the Shepley's Hill Landfill Operable Unit, Alternative 1, is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs, and is the maximum extent practicable for this site. However, because treatment of the

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

source of contamination at the site was found not to be practicable, Alternative 1 does not satisfy the statutory preference for treatment as a principal element of the remedy.

A. The Selected Remedy is Protective of Human Health and the Environment

Alternative SHL-2 will permanently reduce the risks to human health and the environment by eliminating, reducing, or controlling exposures to human and environmental contaminants through engineering and institutional controls. The principal threat at the Landfill Operable Unit is potential residential use of contaminated ground water. The landfill closure plan, approved in 1985 and implemented in 1986 through landfill capping and stormwater controls to reduce leaching of landfill materials, will reduce contamination of groundwater, thereby reducing potential risk associated with groundwater use. Institutional controls included in this alternative would restrict access to groundwater from the contaminated aquifer, resulting in reduced potential exposure to contaminated groundwater. The landfill cover maintenance activities will help ensure protection of human health and the environment by maintaining the integrity and effectiveness of the cover.

The effectiveness of the selected alternative will be evaluated by comparing monitoring data to cleanup levels tabulated in Subsection X.A. Attainment

levels along the eastern edge of the landfill will result in potential human health risk levels within the Superfund target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic chemicals. Groundwater at the north end of the landfill currently meets cleanup levels.

Groundwater modeling done during the FS suggests that capping of the landfill significantly reduced the amount of water in the landfill area, resulting in northerly groundwater flow and reducing potential adverse effects on Plow Groundwater at the north end of the landfill currently meets cleanup level. ecological receptor exposure to contaminated groundwater was identified.

Alternative SHL-9, the contingency remedy for the Shepley's Hill Landfill Unit, is also protective of human health and the environment. Alternative permanently reduce the risks to human health and environment by eliminating or controlling exposures to human and environmental receptors through engineering institutional controls. The principal threat at the Shepley's Hill Landfill is potential residential use of contaminated groundwater. The landfill closure

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

approved in 1985 and implemented in 1986 through 1993, relies on landfill stormwater controls to reduce leaching of landfill materials and contamination of groundwater, thereby reducing potential risk associated with groundwater use. In addition, as part of Alternative SHL-9 groundwater would be pumped from the contaminated aquifer and discharged to the Town of Ayer POTW for treatment and discharge, preventing contaminant migration and potential exposure. Institutional controls included in this alternative would further prevent the use of groundwater from the contaminated aquifer, resulting in reduced potential for human exposure to contaminated groundwater. The landfill cover maintenance activities will protect human health and the environment by maintaining the integrity and effectiveness of the cover.

The effectiveness of the contingency alternative will be evaluated by comparing groundwater monitoring data to cleanup levels tabulated in Subsection X.A. of cleanup levels along the eastern edge of the landfill will result in potential human health risk levels within the Superfund target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic chemicals. Groundwater at the north end of the landfill currently meets cleanup levels.

Groundwater modeling done during the FS suggests that capping of the landfill significantly reduced the amount of water in the landfill area, resulting in northerly groundwater flow and reducing potential adverse effects on Plow Groundwater at the north end of the landfill currently meets cleanup level. ecological receptor exposure to contaminated groundwater was identified.

B. The Selected Remedy Attains ARARs.

The selected remedy will attain all applicable or relevant and appropriate State requirements. No waivers are required. ARARs for the Shepley's Hill Operable Unit were identified and discussed in the FS (Sections 2 and 5). Appendix B summarizes the ARARs for the selected remedy, including the regulatory citation, a brief summary of the requirement, and how it will be attained. laws from which ARARs for the selected remedial action are derived, and specific ARARs include:

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

Location-specific Federal Requirements

Floodplain Management Executive Order No. 11988, (40 CFR Part 6, Ap
A)(Applicable)

Protection of Wetlands Executive Order No. 11990 (Applicable)

Fish and Wildlife Coordination Act, (16 USC 661 et seq.; 40 CFR Par
302)(Applicable)

Endangered Species Act, (16 USC 1531 et seq.; 50 CFR Part 402)(Appl

Location-specific State Requirements

Massachusetts Wetland Protection Act and Regulations, (MGL c. 131 s
CMR 10.00)(Applicable)

Massachusetts Endangered Species Act and implementing regulations,
131A, s. 1 et seq.; 321 CMR 8.00)(Applicable)

Areas of Critical Environmental Concern, (301 CMR 12.00)(Relevant a
Appropriate)

Chemical-specific Federal Requirements

Safe Drinking Water Act, National Primary Drinking Water Standards,
CFR Parts 141.11-141.16 and 141.50-191.51)(Relevant and Appropriate

Chemical-specific State Requirements

Massachusetts Surface Water Quality Standards, (314 CMR 4.00)(Appli

Massachusetts Groundwater Quality Standards, (314 CMR 6.00)(Applica

Massachusetts Drinking Water Standards and Guidelines, (310 CMR
22.00)(Relevant and Appropriate)

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

Massachusetts Ambient Air Quality Standards, (310 CMR 6.00)(Relevan
Appropriate)

Massachusetts Air Pollution Control Regulations, (310 CMR 7.00)(Rel
Appropriate)

Action-specific Federal Requirements

Resource Conservation and Recovery Act (RCRA), (Subtitle D, 40 CFR 258)(Relevant and Appropriate)

Resource Conservation and Recovery Act (RCRA), (Subtitle C, 40 CFR 264)(Relevant and Appropriate)

Action-specific State Requirements

Massachusetts Solid Waste Management Regulations, (310 CMR 19.100)(Applicable)

Massachusetts Hazardous Waste Regulations, (310 CMR 30.00)(Relevant Appropriate)

The contingency remedy, Alternative SHL-9, will also attain all applicable and appropriate federal and State requirements. No waivers are required. the Shepley's Hill Landfill Operable Unit were identified and discussed in (Sections 2 and 5). ARARs for the Alternative SHL-9 are the same as for A SHL-2 with the addition of the General Pretreatment Program regulations (4 promulgated pursuant to the Clean Water Act. These regulations require th nondomestic wastewater discharges to a POTW must comply with the general prohibitions of the regulation, any categorical pretreatment standards, an pretreatment standards. The discharge of groundwater to the POTW would be to evaluate compliance with the regulation.

C. The Selected Remedial Action is Cost-Effective.

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

In the Army's judgment, the selected remedy is cost effective (i.e., the r overall effectiveness proportional to its costs). In selecting this remed identified alternatives that are protective of human health and the enviro attain, or, as appropriate, waive ARARs, the Army evaluated the overall ef each alternative according to the relevant three criteria -- long-term eff permanence; reduction in toxicity, mobility, and volume through treatment; term effectiveness, in combination. The relationship of the overall effec remedial alternative was determined to be proportional to its costs.

Review of the discussion of "Overall Protection of Human Health and the En in Subsection IX.A. and of "Cost" in Subsection IX.G. suggests that Altern SHL-5, SHL-9, and SHL-10 all provide a similar level of protectiveness. H Alternative SHL-2 does so at the lowest cost and is considered the most co those four alternatives. The cost of Alternative SHL-9, although approxim times as much as Alternative SHL-2, is still considered proportional to th Alternative SHL-9 is also considered cost-effective. Alternative SHL-5 is Alternative SHL-9, but costs over twice as much as Alternative SHL-9 and o times as much as Alternative SHL-2: it is not considered cost-effective. SHL-10, which costs nearly ten times as much as Alternative SHL-2, is not cost-effective. The costs of the selected remedy, Alternative SHL-2, in 1

Estimated Capital Cost:	\$ 928,000
Estimated Operation and Maintenance Cost (net present worth):	\$ 1,291,000
Estimated Total Cost (net present worth):	\$ 2,219,000

Should the selected remedy fail to be protective, the contingency remedy, SHL-9, will be implemented, the overall effectiveness of which is proportional to the costs. The costs of the contingency remedy are presented below:

Estimated Capital Cost:	\$ 1,184,000
Estimated Operation and Maintenance Cost (net present worth):	\$ 2,690,000
Estimated Total Cost (net present worth):	\$ 3,874,000

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

D. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment Resource Recovery Technologies to the Maximum Extent Practicable.

Once the Army identified those alternatives that attain or, as appropriate and that are protective of human health and the environment, the Army determined which alternative made use of permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The determination was made by deciding which one of the identified alternatives provided the best balance of trade-offs among alternatives in terms of: (1) long-term permanence; (2) reduction of toxicity, mobility or volume through treatment; (3) long-term effectiveness; (4) implementability; and (5) cost. The balancing test weighed long-term effectiveness and permanence and the reduction of toxicity, mobility or volume through treatment; and considered the preference for treatment as an element, the bias against off-site land disposal of untreated waste, and the state acceptance. The selected remedy provides the best balance of trade-offs among alternatives.

As described in Section IX, Summary of The Comparative Analysis of Alternatives, Alternative SHL-1 does not provide long-term effectiveness and permanence, Alternatives SHL-2, SHL-5, SHL-9, and SHL-10 provide similar long-term effectiveness and permanence.

Alternatives SHL-1, SHL-2, and SHL-10 do not meet the statutory preference for treatment under CERCLA since these alternatives do not treat contaminants in groundwater or wastes at the site. Landfill capping which is a part of the remedy will reduce infiltration and the resulting leaching of contaminants, thus reducing contaminant mobility. Alternatives SHL-5 and SHL-9 meet the CERCLA statutory preference for treatment. These alternatives would reduce the mobility of contaminants by extracting the groundwater for treatment or disposal.

Among the five alternatives, Alternatives SHL-1 and SHL-2 have the least potential for adverse short-term effects while Alternative SHL-10 has the greatest potential for adverse effects. Alternatives SHL-5 and SHL-9 share a similar intermediate potential for adverse effects.

Although Alternative SHL-1 is seen to have the easiest technical implementation

significant obstacles to current implementation or implementation of futur

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

actions are not foreseen for any of the alternatives. Implementation of A 9 does require a long-term discharge agreement between the Army and the To Ayer POTW.

Alternative SHL-1, the No Action alternative, does not require any capital or any ongoing expenditure for operation and maintenance. Of the remainin alternatives, Alternative SHL-2 has the lowest estimated cost. Alternativ approximately four times more than Alternative SHL-2, while Alternative SH approximately two times more than Alternative SHL-2. The estimated cost o Alternative SHL-10 is approximately ten times greater than the cost of Alt SHL-2.

The Army believes Alternative SHL-2 provides the best balance among the al that are protective and attain ARARs. Alternative SHL-2 offers potential effectiveness with little potential for short-term risks. The alternative implementable at a moderate cost. Although named Limited Action, Alternat is based on the presence of an existing landfill cover system designed to applicable MADEP criteria. Installation of the cover system was only comp and Alternative SHL-2 provides an opportunity to monitor and evaluate the of the cover system at controlling groundwater contamination. The selecti Alternative SHL-2 is cost-effective and consistent with USEPA guidance con USEPA document Conducting Remedial Investigations/Feasibility Studies for Municipal Landfill Sites, which states that the most practical remedial al landfills is generally containment by capping.

The Army believes the contingency remedy, Alternative SHL-9, provides the balance among the alternatives that are protective and attain ARARs. Alte 9 offers potential long-term effectiveness, but compared to Alternative SH somewhat greater potential for short-term risks. The alternative is readi implementable at approximately twice the cost of Alternative SHL-2. Simil Alternative SHL-2, Alternative SHL-9 is based on the presence of an existi cover system designed to comply with applicable MADEP criteria. Alternati has groundwater extraction and treatment/disposal components to further co contaminant migration and potential exposure.

W0099518.080

DE
Shepley's Hill Landfill
Fort Devens,

E. The Selected Remedy Does Not Satisfy the Preference for Treatment W Permanently and Significantly Reduces the Toxicity, Mobility, and V Hazardous Substances as a Principal Element

The principal element of the selected remedy is source control by containm materials. This element addresses the primary threat at the Shepley's Hil

Operable Unit, which is potential residential use of contaminated groundwater controlling the leaching of landfill materials and the release of contaminants into groundwater. Therefore, the selected remedy does reduce contaminant mobility by treatment. In-situ treatment, or alternately the excavation and treatment of large, heterogeneous landfill as Shepley's Hill Landfill is considered impractical and cost effective. If the selected remedy proves not to be protective, the contingency alternative (Alternative SHL-9), which includes groundwater extraction and will be implemented to attain cleanup levels.

XII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Army presented a proposed plan (preferred alternative) for remediation of Shepley's Hill Landfill Operable Unit on June 6, 1995. The plan for the preferred alternative (Alternative SHL-2: Limited Action) included

- survey of Shepley's Hill Landfill;
- evaluation/improvement of stormwater diversion and drainage;
- landfill cover maintenance;
- landfill gas collection system maintenance;
- long-term groundwater monitoring;
- long-term landfill gas monitoring;
- institutional controls;
- educational programs;
- 60 percent design of a groundwater extraction system
- annual reporting to MADEP and USEPA; and
- five-year site reviews.

New information obtained prior to the final selection of the remedy for Shepley's Hill Landfill Operable Unit resulted in a modification of the preferred alternative in the proposed plan. The preferred alternative, Alternative SHL-2, was

W0099518.080

DECISION SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

because approval of landfill closure documents and official closure of the landfill by MADEP under applicable requirements of 310 CMR 19.000 were expected prior to Record of Decision signature. However, although construction of the cap is complete, and the Army has submitted supporting documentation to MADEP, landfill closure will not be officially complete until MADEP approves the

Consequently, the selected remedy has been modified to include achievement of the official closure of the landfill by MADEP. The ARARs table has been modified to reflect this additional remedial requirement. This change, though significant, has little or no effect on the scope, performance, or proposed remedy, and does not require additional public comment.

The contingency remedy, Alternative SHL-9, has also been modified from the plan to include achievement by the Army of official closure of the landfill pursuant to applicable requirements of 310 CMR 19.000.

XIII. STATE ROLE

The Commonwealth of Massachusetts has reviewed the alternatives presented

and proposed plan and concurs with the selected remedy for the Shepley's H Operable Unit. The Commonwealth has also reviewed the RI, RI Addendum, and determine if the selected remedy complies with applicable or relevant and laws and regulations of the Commonwealth. A copy of the declaration of co attached as Appendix E.

W0099518.080

RECORD OF DECISION
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

APPENDIX A - FIGURES

W0099518.080

RECORD OF DECISION
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

APPENDIX B - TABLES

W0099518.080

TABLE 1
SUMMARY STATISTICS FOR SHEPLEY'S HILL LANDFILL GROUNDWATER
WELL GROUP1

RECORD OF DECISION
SHEPLEY'S HILL LANDFILL OPERABLE UNIT
FORT DEVENS, MA

ANALYTE UNFILTERED SAMPLES	FREQUENCY	MAXIMUM DETECTED OF CONCENTRATION	ARITHMETIC MEAN
	DETECTION	(æg/L)	(æg/L)
1,1-Dichloroethane	4 /14	4.4	0.8
1,2-Dichloroethane	5 /14	9.9	0.9

1,2-Dichloroethane (cis & trans)	6 /14	7	1.
1,2-Dichloropropane	1 /14	0.52	0.2
Acetone	1 /14	15	
Benzene	3 /14	1.7	0.5
Chloroethane	1 /14	5.5	1.
Chloroform	3 /14	0.87	0.3
Dichlorobenzenes (total)	1 /14	11	5.
Toluene	1 /14	0.56	0.2
Aluminum	13 /14	75500	425
Antimony	2 /14	3.3	1.
Arsenic	12 /14	390	10
Barium	13 /14	350	47.
Calcium	14 /14	219000	5428
Chromium	5 /14	115	
Cobalt	1 /14	54.6	1
Copper	4 /14	92.2	8.
Iron	14 /14	97400	1760
Lead	10 /14	66.8	5.
Magnesium	14 /14	24000	760
Manganese	14 /14	9650	204
Nickel	1 /14	177	22.
Potassium	13 /14	31800	711
Sodium	14 /14	67300	2074
Vanadium	3 /14	79.1	9.
Zinc	3 /14	220	29.

FILTERED SAMPLES3

Aluminum	1 /10	236 BB	N
Antimony	1 /10	3.12	
Arsenic	6 /10	270	7
Barium	10 /10	117	3
Calcium	10 /10	175000	3740
Iron	7 /10	91600	1442
Lead	2 /10	1.52 BB	N
Magnesium	9 /10	19900	467
Manganese	10 /10	9540	181
Potassium	9 /10	10600	412
Sodium	10 /10	64600	1693
Zinc	1 /10	25.5	1

Notes:

NA = Not applicable

µg/L = Micrograms per liter

BB = Less than background concentration

1 From March and June 1993 sampling rounds

2 Unfiltered samples from monitoring wells SHL-3, SHL-4, SHL-5, SHL-9, SHL-SHL-19, SHL-20, SHL-22, SHM-93-01A, SHM-93-10C, SHM-93-18B, SHM-93-22C

3 Filtered samples from monitoring wells SHL-3, SHL-4, SHL-5, SHL-9, SHL-1SHL-20, SHM-93-01A, SHM-93-18B

TABLE 2
SUMMARY STATISTICS FOR SHEPLEY'S HILL LANDFILL GROUNDWATER
WELL GROUP 31

RECORD OF DECISION
SHEPLEY'S HILL LANDFILL OPERABLE UNIT
FORT DEVENS, MA

ANALYTE	FREQUENCY OF DETECTION	MAXIMUM DETECTED CONCENTRATION (æg/L)	ARITHMETIC MEAN (æg/L)
UNFILTERED SAMPLES ¹			
Aluminum	2/4	4030 BB	18
Arsenic	2/4	17	8
Barium	4/4	28 BB	
Calcium	4/4	15400	11
Chromium	2/4	7.38 BB	5
Iron	4/4	5350 BB	25
Lead	2/4	7.38	3
Magnesium	4/4	2850 BB	19
Manganese	4/4	1590	6
Potassium	4/4	2080 BB	19
Sodium	4/4	17300	76

FILTERED SAMPLES³

Barium	1/1	8.71 BB	
Calcium	1/1	11000 BB	
Magnesium	1/1	1840 BB	
Manganese	1/1	114 BB	
Potassium	1/1	829 BB	
Sodium	1/1	16400	

Notes:

æg/L = Micrograms per liter

NA = Not applicable

BB = Less than background concentration

1 From March 1993 sampling round.

2 Unfiltered samples from monitoring wells SHL-8D, SHL-8S, SHL-13, SHL-21.

3 Filtered samples from monitoring well SHL-13.

TABLE 3
SUMMARY STATISTICS FOR SHEPLEY'S HILL LANDFILL GROUNDWATER
WELL GROUP 41

RECORD OF DECISION SHEPLEY'S HILL LANDFILL OPERABLE UNIT FORT DEVENS, MA

ANALYTE	FREQUENCY OF DETECTION	MAXIMUM CONCENTRATION (æg/L)	DETECTED MEAN (æg/L)	ARITHMETIC COPC (æg/L)
UNFILTERED SAMPLES ¹				
Trichlorofluoromethane	1 / 1		2.1	
Aluminum	1 / 1		1330 BB	
Arsenic	1 / 1		24	
Barium	1 / 1		39.4 BB	
Calcium	1 / 1		15600	
Iron	1 / 1		1840 BB	

Lead	1 / 1	3.69 BB
Magnesium	1 / 1	1900 BB
Manganese	1 / 1	1430
Potassium	1 / 1	3260
Sodium	1 / 1	7370 BB
Zinc	1 / 1	35.8

FILTERED SAMPLES3

Barium	1 / 1	26.2 BB
Calcium	1 / 1	16900
Chromium	1 / 1	6.95 BB
Iron	1 / 1	42.5 BB
Lead	1 / 1	1.63 BB
Magnesium	1 / 1	1860 BB
Manganese	1 / 1	1850
Potassium	1 / 1	1870 BB
Sodium	1 / 1	7630 BB
Zinc	1 / 1	28.8

Notes:

æg/L = Micrograms per liter

NA = Not applicable

BB = Less than background concentration

1 From March 1993 sampling record

2 Unfiltered samples from monitoring well SHL-15

3 Filtered samples from monitoring well SHL-15

TABLE 4
SUMMARY STATISTICS FOR ANALYTE CONCENTRATIONS
IN PLOW SHOP POND BLUEGILLS (WHOLE FISH)1

RECORD OF DECISION SHEPLEY'S HILL LANDFILL OPERABLE UNIT FORT DEVENS, MA

ANALYTE	FREQUENCY OF DETECTION	MINIMUM CONCENTRATION	MAXIMUM CONCENTRATION	ARITH
Pesticides (æg/kg)				
DDE	2/5		21	
Inorganics (mg/kg)				
Aluminum	5/5		1.6	4
Arsenic	1/5		1.3	1
Barium	5/5		1.3	4
Calcium	5/5		23300	488
Chromium	5/5		0.48	0.
Cobalt	4/5		0.1	0.
Copper	5/5		0.44	0
Iron	5/5		42.4	1
Lead	1/5		0.16	0.
Magnesium	5/5		496	7
Manganese	5/5		39.1	94
Mercury	5/5		0.19	0.
Selenium	5/5		0.42	0.
Sodium	5/5		1480	22
Thallium	1/5		0.1	0

Zinc

5/5

22.2

29

Notes:

æg/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

1 Table includes detected analytes only.

All detected analytes were included as COPCs.

TABLE 5
SUMMARY STATISTICS FOR ANALYTE CONCENTRATIONS
IN PLOW SHOP POND BULLHEAD AND BASS (FILLET)1

RECORD OF DECISION
SHEPLEY'S HILL LANDFILL OPERABLE UNIT
FORT DEVENS, MA

ANALYTE	FREQUENCY OF DETECTION	MINIMUM CONCENTRATION	MAXIMUM CONCENTRATION	ARITH CONCENTRATION
Pesticides (æg/kg)				
DDE	2/10		15	
Inorganics (mg/kg)				
Arsenic	2/10		0.09	
Calcium	10/10		82.8	
Chromium	2/10		0.19	
Cobalt	2/10		0.11	
Copper	10/10		0.08	
Iron	10/10		1.7	
Magnesium	10/10		252	
Manganese	1/10		0.3	
Mercury	9/10		0.12	
Selenium	8/10		0.11	
Sodium	10/10		283	
Zinc	10/10		3.4	6.1

Notes:

æg/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

1 Table includes detected analytes only.

All detected analytes were included as COPCs.

TABLE 6
SUMMARY STATISTICS FOR PLOW SHOP POND SHALLOW SEDIMENT1

RECORD OF DECISION
SHEPLEY'S HILL LANDFILL OPERABLE UNIT
FORT DEVENS, MA

ANALYTE	FREQUENCY OF DETECTION	MEAN	CONCENTRATION MAXIMUM (æg/g)	COPC (æg/g)
ORGANICS				
Acetone		9/13	0.19	0.55

Mmethylene chloride	11/13	0.05	0.12
2-butanone	5/13	0.04	0.13
Benzo(a)anthracene	1/13	0.22	1.1
Chrysene	1/13	0.32	1.5
Fluoranthene	1/13	0.5	3.4
Naphthalene	1/13	0.32	1.6
Phenanthrene	1/13	0.38	2.5
Pyrene	3/13	0.97	4.35
DDE	6/41	0.05	1.3
DDD	4//41	0.07	1.8
DDT	1/41	0.03	0.13
Heptachlor	2/41	0.006	0.092
INORGANICS			
Aluminum	41/41	7,938	24,000
Arsenic	41/41	467	3,200
Barium	38/41	108	344
Beryllium	8/41	0.53	2.72
Cadmium	13/41	9.8	60
Calcium	39/41	8,074	20,100
Cobalt	8/41	5.8	58.7
Chromium	38/41	1.987	10,000
Copper	30/41	39.7	132
Iron	41/41	36,314	330,000
Lead	40/41	125	632
Magnesium	36/41	1,629	6,900
Manganese	37/41	2,639	54,800
Mercury	37/41	18.2	130
Nickel	25/41	23	79.3
Potassium	17/41	435	2,350
Selenium	12/41	1.95	6.6
Sodium	35/41	1,113	2,870
Vanadium	15/41	24.6	166
Zinc	17/41	88.6	403

Notes:

æg/g = micrograms per gram

1. Based on sediment samples SE-SHL-01 through SE-SHL-13 (April 1993 RI)
SHD-92-28 at depths of less than 1 foot.

TABLE 7
CHEMICALS OF POTENTIAL CONCERN1 IN

ASSESSMENT

SHEPLEY'S HILL L

RECORD OF DEC
SHEPLEY'S HILL LANDFILL
FORT DEVENS,

GROUP	CHEMICAL OF POTENTIAL CONCERN	FISH TISSUE	SEDIMENT
1	WELL GROUP 3	WELL GROUP 4	
	Inorganics		
	Aluminum	X	X
	Antimony		X
	Arsenic	X	X
	Barium	X	X
	Beryllium	X	

Calcium				X		X
Cadmium						X
Chromium				X		X
Cobalt				X		X
Copper				X		X
Iron			X		X	X
Lead				X		X
Magnesium	X		X		X	
Manganese	X		X		X	
Mercury	X		X			
Nickel						X
Potassium						X
Selenium				X		X
Sodium	X		X		X	
Thallium				X		
Vanadium			X		X	
Zinc				X		X

TABLE 7
CHEMICALS OF POTENTIAL CONCERN1 IN

ASSESSMENT

SHEPLEY'S HILL L

RECORD OF DEC
SHEPLEY'S HILL LANDFILL
FORT DEVENS,

CHEMICAL OF POTENTIAL CONCERN	FISH TISSUE	GROUNDWATER SEDIMENT
VOCs		
Benzene		
Chloroethane		
Chloroform		X
1,1-Dichloroethane		X
1,2-Dichloroethane		X
1,2-Dichloroethene (cis & trans)		
1,2-Dichloropropane		
Trichlorofluoromethane		
SVOCs		
Dichlorobenzenes (total)		
Benzo(a)anthracene	X	
Chrysene		X
Fluoranthene		X
Naphthalene		X
Phenanthrene		X
Pyrene		X
Pesticides/PCBs		
DDD		X
DDE	X	X
DDT		X

TABLE 8
SUMMARY OF COVER SYSTEM PER

RECORD OF DECI
SHEPLEY'S HILL LANDFILL
FORT DEVENS,

MASSACHUSETTS SOLID WASTE REGULATIONS HOW COMPLIANCE IS ACHIEVED 310 CMR 19.000 EXISTING COVER	RCRA SUBTITLE C 40 CFR 264	RCRA SUBTITLE D 40 CFR 258
Minimize percolation installations such as the existing of water into landfill. Landfill have a permeability	Minimize migration of liquids through landfill.	Minimize Infiltration through landfill.
permeability is less than landfill. There is no	Have a permeability less than or equal to bottom liner or subsoils.	Have a permeability less than or equal to bottom liner or subsoils or less than 10 E-5 centimeters per second, whichever is less.
Promote drainage of sloped to promote drainage precipitation.	Promote drainage and minimize erosion.	
Minimize erosion of vegetated to final cover.		Minimize erosion of final cover.
manner and maintain	Function with minimum maintenance.	
Facilitate gas venting. system		

W007956T/1

(continued)

TABLE 8
SUMMARY OF COVER SYSTEM PER

RECORD OF DECI
SHEPLEY'S HILL LANDFILL
FORT DEVENS,

MASSACHUSETTS SOLID WASTE REGULATIONS HOW COMPLIANCE IS ACHIEVED 310 CMR 19.000 EXISTING COVER	RCRA SUBTITLE C 40 CFR 264	RCRA SUBTITLE D 40 CFR 258
Minimize percolation installations such as the existing of water into landfill. Landfill have a permeability	Minimize migration of liquids through landfill.	Minimize infiltration through landfill.

Accommodate settling compacted and graded and subsidence to existing cap to continue to meet Maintenance actions are performance or when standards.	Accommodate settling and subsidence to maintain cover integrity.
Ensure isolate of potential wastes from environment. interpreted	

W007956T/2

TABLE 9
SYNOPSIS OF FEDERAL AND STATE ARARS FOR AL

ACTION

RECORD OF DECI
SHEPLEY'S HILL LANDFILL
FORT DEVENS,

TO	LOCATION		
SYNOPSIS	AUTHORITY	CHARACTERISTIC ATTAIN REQUIREMENT	REQUIREMENT STATUS
Federal To the extent that any Regulatory associated with this Authority	Floodplains any	Floodplain Management Executive Order No. 11988, [40 CFR Part 6,	Applicable

App. A]

Protection of Wetlands	Applicable
Executive Order No.	
11990	

(continued)

ACTION

TO	LOCATION		
AUTHORITY	CHARACTERISTIC	REQUIREMENT	STATUS
SYNOPSIS	ATTAIN	REQUIREMENT	
No off-site remedial actions performed for this alternative. On-site minimal and	Surface Waters Endangered Species	Fish and Wildlife Coordination Act [16 USC 661 et seq.; 40 CFR Part 302]	Applicable

minimize impact, landfill	Endangered Species	Endangered Species Act	Applicable
maintenance would		[16 USC 1531 et seq.; 50	
after nesting		CFR Part 402]	

W0099518/2

(continued)

	TABLE 9
	SYNOPSIS OF FEDERAL AND STATE ARARS FOR AL
ACTION	RECORD OF DECI
	SHEPLEY'S HILL LANDFILL
	FORT DEVENS,

TAKEN TO	LOCATION		
SYNOPSIS	CHARACTERISTIC	REQUIREMENT	STATUS
State	Floodplains	Massachusetts Wetland	Applicable
If remedial activities alter	Wetlands	Protection Act and	
Regulatory		Regulations [MGL c. 131	
than 5,000 square		s. 40; 310 CMR 10.00]	
Authority			
protected area, the			
area will be			
growing			

To minimize impacts, cover maintenance performed after areas of the Sparrow have	Endangered Species	Massachusetts Endangered Species Act and implementing regulations [MGL c. 131A, s. 1 et seq.; 321 CMR 8.00]	Applicable
--	--------------------	---	------------

W0099518T/3

(continued)

TABLE 9
SYNOPSIS OF FEDERAL AND STATE ARARs FOR AL

ACTION

RECORD OF DECI SHEPLEY'S HILL LANDFILL FORT DEVENS,			
TO	LOCATION		
SYNOPSIS	AUTHORITY	CHARACTERISTIC ATTAIN REQUIREMENT	REQUIREMENT
Activities must be controlled or to minimize impacts to nesting areas of the Sparrow.		Area of Critical Environmental Concern	Areas of Critical Environmental Concern [301 CMR 12.00]
			Relevant and Appropriate

W0099518T/4

(continued)

TABLE 9
SYNOPSIS OF FEDERAL AND STATE ARARs FOR AL

ACTION

RECORD OF DECI
SHEPLEY'S HILL LANDFILL
FORT DEVENS,

AUTHORITY SYNOPSIS	CHEMICAL MEDIUM	REQUIREMENT	STATUS
Federal MCLs will be used to evaluate the Regulatory performance of this alternative. If Authority MCLs are exceeded, the remedy will re-evaluated.	Groundwater	Safe Drinking Water Act, National Primary Drinking Water Standards, MCLs [40 CFR Parts 141.11 - 141.16 and 141.50- 191.51]	Relevant and Appropriate
State Discharges associated with remedial Regulatory be controlled/monitored Authority that surface waters meet	Surface water	Massachusetts Surface Water Quality Standards [314 CMR 4.00]	Applicable

W0099518T/5

(continued)

TABLE 9
SYNOPSIS OF FEDERAL AND STATE ARARS FOR AL

ACTION

RECORD OF DECI
SHEPLEY'S HILL LANDFILL
FORT DEVENS,

TO ATTAIN AUTHORITY	CHEMICAL MEDIUM	REQUIREMENT	STATUS	REQUI
MCLs will be used to evaluate the	Groundwater	Massachusetts		Applicable

of this alternative. If exceeded, the remedy will

Groundwater Quality Standards [314 CMR 6.00]

Groundwater MMCLs will be used to evaluate the performance of this alternative. If MMCLs are exceeded, the remedy

Massachusetts Drinking Water Standards and Guidelines [310 CMR 22.00] Relevant and Appropriate

W0099518T/6

(continued)

ACTION

TABLE 9
SYNOPSIS OF FEDERAL AND STATE ARARs FOR AL

RECORD OF DECI
SHEPLEY'S HILL LANDFILL
FORT DEVENS,

TO ATTAIN	CHEMICAL	REQUIREMENT	STATUS
AUTHORITY	MEDIUM	REQUIREMENT	
SYNOPSIS			
Air		Massachusetts Ambient	Relevant
Air Quality Standards will be		Air Quality Standards	and
evaluate the performance of		[310 CMR 6.00]	Appropriate
alternative. If standards are			
Air		Massachusetts Air	Relevant
Air Quality Standards will be		Pollution Control	and
evaluate the performance of		Regulations [310 CMR	Appropriate
alternative. If standards are			

7.00]

remedy will be re-

W0099518T/7

(continued)

TABLE 9
SYNOPSIS OF FEDERAL AND STATE ARARS FOR AL

ACTION

RECORD OF DECI
SHEPLEY'S HILL LANDFILL
FORT DEVENS,

AUTHORITY SYNOPSIS	ACTION	REQUIREMENT	STATUS
Federal Performance of this alternative will be Regulatory evaluated to determine compliance Authority with the substantive requirements of solid waste regulations. If the requirements are not met the remedy	Solid waste landfill construc- tion, operation, closure, and post-closure	Resource Conservation and Recovery Act (RCRA) [Subtitle D, 40 CFR 258]	Relevant and Appropriat
Performance of this alternative will be to determine compliance the substantive requirements of hazardous waste regulations. requirements are appropriate time, the	Hazardous waste landfill construction, operation, closure, and post-closure	Resource Conservation and Recovery Act (RCRA) [Subtitle C, 40 CFR 260,264]	Relevant and Appropriat
State alternative includes Regulatory meet closure and post-closure Authority requirements at Shepley's Hill	Solid waste components landfill construction, operation, closure, and post-closure.	Massachusetts Solid Waste Management Regulations [310 CMR 19.000]	Applicable

W0099518T/8

(continued)

TABLE 9
SYNOPSIS OF FEDERAL AND STATE ARARs FOR AL

ACTION

RECORD OF DECI
SHEPLEY'S HILL LANDFILL
FORT DEVENS,

AUTHORITY SYNOPSIS	ACTION REQUIREMENT	REQUIREMENT	STATUS
Performance of this alternative will be to determine compliance the substantive requirements of waste	Hazardous waste landfill construction, operation closure, and post-closure	Massachusetts Hazardous Waste Regulations [310 CMR 30.00]	Relevant and Appropriate

W0099518T/9

RECORD OF DECISION
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

APPENDIX C - RESPONSIVENESS SUMMARY

W0099518.080

RESPONSIVENESS SUMMARY
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

This Responsiveness Summary has been prepared to meet the requirements of 113(k)(2)(B)(iv) and 117(b) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), which requires response significant comments, criticisms, and new data submitted in written or oral on a proposed plan for remedial action. The purpose of this Responsiveness to document Army responses to questions and comments expressed during the comment period by the public, potentially responsible parties, and government in written and oral comments regarding the proposed plan for the Shepley's Operable Unit.

The Army held a 30-day public comment period from June 1 to June 30, 1995 an opportunity for interested parties to comment on the Feasibility Study plan, and other documents developed to address the cleanup of contaminated groundwater at the Shepley's Hill Landfill Operable Unit at Fort Devens, MA. The FS developed and evaluated various options (referred to as remedial alternatives) to address human health and ecological risk from exposure to contaminated groundwater and potential migration of substances present in groundwater at the Shepley Landfill Operable Unit. The Army identified its preferred alternative for groundwater in the proposed plan issued on May 31, 1995.

All documents on which the preferred alternative were based were placed in Administrative Record for review. The Administrative Record contains all documentation considered by the Army in choosing the remedy for Shepley's Landfill Operable Unit. The Administrative Record is available to the public at the Fort Devens Base Realignment and Closure (BRAC) Environmental Office, Building 1000, Fort Devens, and at the Ayer Town Hall, Main Street, Ayer. An index to the Administrative Record is available at the U.S. Environmental Protection Agency (USEPA) Records Center, 90 Canal Street, Boston, Massachusetts and is provided in Appendix D to the Record of Decision.

This Responsiveness Summary is organized into the following sections:

- I. Overview of Remedial Alternatives Considered in the FS Including the Selected Remedy-This section briefly outlines the remedial alternatives evaluated in the FS and presented in the proposed plan, including the Army's selected remedy.

W0099518.080

RESPONSIVENESS SUMMARY Shepley's Hill Landfill Operable Unit Fort Devens, Massachusetts

- II. Background on Community Involvement-This section provides a brief history of community involvement and Army initiatives in informing the community about the cleanup activities.
- III. Summary of Comments Received During the Public Comment Period and Army Responses-This section provides Army responses to oral and written comments received from the public and not formally responded to during the public comment period. A transcript of the public meeting consisting of a list of comments received during this meeting and the Army's responses to these comments is provided in Attachment A of this Responsiveness Summary.

- I. OVERVIEW OF REMEDIAL ALTERNATIVES CONSIDERED IN THE FS INCLUDING THE SELECTED REMEDY

Ten remedial alternatives were developed in the FS report and screened based on implementability, effectiveness, and cost to narrow the number of remedial alternatives for detailed analysis. Of the initial ten, five were retained for detailed analysis. The five retained alternatives are:

- A. Alternative SHL-1: No-Action

The No Action alternative does not contain any remedial action components

existing landfill cover system to reduce or control potential risks. No institutional controls would be implemented to prevent future human exposure, and existing systems would be maintained to monitor for potential future releases would be required. Alternative SHL-1 is developed to provide a baseline for comparison with other remedial alternatives.

B. Alternative SHL-2: Limited Action

Alternative SHL-2 contains components to maintain and potentially improve effectiveness of the existing landfill cover system and to satisfy the Land Use Requirements of 310 CMR 19.142 to reduce potential future exposure to contaminated groundwater. Key components of this alternative include:

W0099518.080

RESPONSIVENESS SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

- landfill closure in accordance with applicable requirements of 310 CMR 19.000;
- survey of Shepley's Hill Landfill;
- evaluation/improvement of stormwater diversion and drainage;
- landfill cover maintenance;
- landfill gas collection system maintenance;
- long-term groundwater monitoring;
- long-term landfill gas monitoring;
- institutional controls;
- educational programs;
- 60 percent design of a groundwater extraction system;
- annual reporting to Massachusetts Department of Environmental Protection (MADEP) and USEPA; and
- five-year site reviews.

The Army's selected remedy is Alternative SHL-2, with Alternative SHL-9 as contingency remedy.

C. Alternative SHL-5: Collection/Ion Exchange Treatment/Surface Water

Alternative SHL-5 consists of components that, together with the component of Alternative SHL-2, would provide additional controls to prevent off-site migration of contaminated groundwater. Key components of Alternative SHL-5 include:

- landfill closure in accordance with applicable requirements of 310 CMR 19.000;
- design, construction, operation, and maintenance of groundwater extraction, treatment, and discharge facilities;
- survey of Shepley's Hill Landfill;
- evaluation/improvement of stormwater diversion and drainage;
- landfill cover maintenance;
- landfill gas collection system maintenance;
- long-term groundwater monitoring;
- long-term landfill gas monitoring;
- institutional controls;
- educational programs;
- annual reporting to MADEP and USEPA; and
- five-year site reviews.

W0099518.080

RESPONSIVENESS SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

The major difference between Alternative SHL-5 and Alternative SHL-2 is the construction and operation of groundwater extraction, treatment, and discharge. Data collected during predesign studies would be used to optimize the size of groundwater extraction wells at Shepley's Hill Landfill. Contaminated groundwater would be treated in an on-site groundwater treatment facility that (subject to future studies) includes carbon adsorption, sand filtration, and ion exchange treatment. Discharges would be through an effluent pipeline to Nonacoicus Brook.

D. Alternative SHL-9: Collection/Discharge to POTW

Alternative SHL-9 adds the components of groundwater extraction and discharge to the Town of Ayer publicly owned treatment works (POTW) to Alternative SHL-2. In addition to the additional control to prevent off-site migration of contaminated groundwater, components of Alternative SHL-9 include:

- landfill closure in accordance with applicable requirements of 301 CMR 19.000;
- design, construction, operation, and maintenance of groundwater extraction and discharge facilities;
- survey of Shepley's Hill Landfill;
- evaluation/improvement of stormwater diversion and drainage;
- landfill cover maintenance;
- landfill gas collection system maintenance;
- long-term groundwater monitoring;
- long-term landfill gas monitoring;
- institutional controls;
- educational programs;
- annual reporting to MADEP and USEPA; and
- five-year site reviews.

The major difference between Alternative SHL-9 and Alternative SHL-2 is the construction and operation of groundwater extraction and discharge facilities. Data collected during predesign studies would be used to optimize the size and location of groundwater extraction wells at Shepley's Hill Landfill. Following construction of groundwater extraction facilities, contaminated groundwater would be pumped to a discharge manhole anticipated to be located on Scully Road near the north end of the landfill. There, the groundwater would combine with domestic wastewater at the Town of Ayer POTW for treatment and subsequent discharge. The Ayer POTW

W0099518.080

RESPONSIVENESS SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

The existing groundwater monitoring system, with a capacity of 1.79 million gallons per day (MGD), would be able to handle an additional anticipated volume of 20 to 30 gallons per minute (0.029 to 0.038 MGD).

Review of available groundwater monitoring data suggests that pretreatment

groundwater will not be needed to meet existing pretreatment standards est the Town of Ayer. The Army would monitor the groundwater discharge to the however, and if necessary install pretreatment facilities to meet pretreat The Army would pay a sewer user fee to the town based on the volume of wat discharged to the POTW.

E. Alternative SHL-10: Installation of RCRA Cap

Alternative SHL-10 consists of building a new landfill cover system on top cover system at Shepley's Hill Landfill. The new cover system would be de meet Resource Conservation and Recovery Act (RCRA) performance criteria an guidance for hazardous waste landfills. The principal component of the ne system would be a 24-inch layer of low permeability soil in intimate conta geomembrane. Maintenance activities, monitoring and reporting requirement institutional controls would be similar to those of Alternative SHL-2.

II. BACKGROUND ON COMMUNITY INVOLVEMENT

Community concern and involvement have been low throughout the history of Hill Landfill. Although the Army has kept the community and other interes informed of site activities through regular and frequent informational mee sheets, press releases, and public meetings, no members of the public atte informational meeting on the proposed plan or the public hearing.

In February 1992 the Army released, following public review, a community r that outlined a program to address community concerns and keep citizens in about and involved in remedial activities at Fort Devens. As part of this established a Technical Review Committee (TRC) in early 1992. The TRC, as by SARA Section 211 and Army Regulation 200-1, included representatives fr USEPA, U.S. Army Environmental Center (USAEC), Fort Devens, MADEP, local officials and the community. Until January 1994, when it was replaced by Restoration Advisory Board (RAB), the committee generally met quarterly to provide technical comments on schedules, work plans, work products, and pr

W0099518.080

RESPONSIVENESS SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

activities for the Study Areas at Fort Devens. The Remedial Investigation Addendum, and FS reports, proposed plan, and other related support documen submitted to the TRC or RAB for their review and comment.

The Army, as part of its commitment to involve the affected communities, f when an installation closure involves transfer of property to the communit Devens RAB was formed in February 1994 to add members of the Citizen's Adv Committee (CAC) to the TRC. The CAC had been established previously to ad Massachusetts Environmental Policy Act/Environmental Assessment issues con the reuse of property at Fort Devens. The RAB consists of 28 members (15 TRC members plus 13 new members) who are representatives from the Army, US Region I, MADEP, local governments and citizens of the local communities. monthly and provides advice to the installation and regulatory agencies on cleanup programs. Specific responsibilities include: addressing cleanup land use and cleanup goals; reviewing plans and documents; identifying pro requirements and priorities; and conducting regular meetings that are open The Army presented the proposed plan for the Shepley's Hill Landfill Opera

the May 4, 1995 RAB meeting.

On May 31, 1995, the Army issued a fact sheet to citizens and organization the public with a brief explanation of the Army's preferred remedy for cle groundwater at the Shepley's Hill Landfill Operable Unit. The fact sheet the opportunities for public participation and provided details on the upc comment period and public meetings.

During the week of May 22, the Army published a public notice announcing t proposed plan, public informational meeting, and public hearing in the Tim and the Lowell Sun. A public notice announcing the public hearing was pub week of June 12, 1995 in the Times Free Press and the week of June 19, 199 Lowell Sun. The Army also made the proposed plan available to the public information repositories at the libraries in Ayer, Shirley, Lancaster, Har Devens.

From June 1 to June 30, 1995, the Army held a 30-day public comment period public comments on the alternatives presented in the FS and the proposed p other documents released to the public. On June 6, 1995, the Army held an informational meeting at Fort Devens to present the Army's proposed plan t and discuss the cleanup alternatives evaluated in the FS. This meeting al opportunity for open discussion concerning the proposed cleanup. On June

W0099518.080

RESPONSIVENESS SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

Army held an informal public hearing at Fort Devens to discuss the propose to accept verbal or written comments from the public.

All supporting documentation for the decision regarding the Shepley's Hill Operable Unit is contained in the Administrative Record for review. The A Record is a collection of all the documents considered by the Army in choo remedy for the Shepley's Hill Landfill Operable Unit. On June 2, 1995, th the Administrative Record available for public review at the Fort Devens B Environmental Office, and at the Ayer Town Hall, Ayer, Massachusetts. An Administrative Record is available at the USEPA Records Center, 90 Canal S Boston, Massachusetts and is provided as Appendix D.

III. SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND ARMY RESPONSES

No comments were received during the public comment period.

W0099518.080

RESPONSIVENESS SUMMARY

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

ABB ENVIRONMENTAL SERVICES, INC.

PROPOSED PLAN

SHEPLEY'S HILL LANDFILL OPERABLE UNIT

FORT DEVENS, MASSACHUSETTS

PUBLIC HEARING

HELD AT:

FORT DEVENS, MASSACHUSETTS

TUESDAY, JUNE 27, 1995

7:00 P.M.

(Robin Gross, Registered Professional Reporter)

DORIS O. WONG ASSOCIATES

Attorneys Notes

1 P R O C E E D I N G S

2 MR. CHAMBERS: Welcome, everybody, to Fort
3 Devens. My name is James Chambers. I'm the BRAC
4 environmental coordinator for the U.S. Army here at
5 Fort Devens.

6 Tonight's hearing is in regards to the
7 remedial action proposed plan for Shepley's Hill
8 Landfill, and I'd like to open up the floor to
9 comments. We do have a court stenographer here
10 tonight to officially record your comments.

11 I'd like to recognize Ms. Lynn Welsh from
12 the Massachusetts Department of Environmental

13 Protection; Mr. James Byrne of the U.S.
14 Environmental Protection Agency; Mr. Gerry Keefe
15 from the U.S. Environmental Protection Agency; Mr.
16 Charles George from the U.S. Army Environmental
17 Center; and Mr. Paul Exner and Mr. Stan Reed
18 representing ABB Environmental Services.

19 (Recess taken)

20 MR. CHAMBERS: It's now 7:30. Let the
21 record show that we were prepared to make a
22 presentation this evening and no members of the
23 public showed.

24 The 30th of June is the last day for

DORIS O. WONG ASSOCIATES

1 submitting written comments. Thank you.

2 (Whereupon, the hearing was
3 adjourned at 7:30 p.m.)

4
5
6
7
8
9
10
11
12
13
14
15
16

17

18

19

20

21

22

23

24

DORIS O. WONG ASSOCIATES

1

C E R T I F I C A T E

2

I, Robin Gross, Registered Professional
Reporter, do hereby certify that the foregoing
transcript, Volume I, is a true and accurate
transcription of my stenographic notes taken on June
27, 1995.

7

8

9

10

Robin Gross

11

Registered Professional Reporter

12

13

14

- - - -

15

16

17

18

19

20

21

22

23

24

DORIS O. WONG ASSOCIATES

RECORD OF DECISION
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

APPENDIX D - ADMINISTRATIVE RECORD INDEX

W0099518.080

Fort Devens

Group 1A Sites
Shepley's Hill Landfill Operable Unit
Administrative Record File

Index

Prepared for
New England Division
Corps of Engineers

by
ABB ENVIRONMENTAL SERVICES, INC.
107 Audubon Road, Wakefield, Massachusetts 01880 (617) 245-66

Introduction

This document is the Index to the Administrative Record File for Fort Devens Group 1A Shepley's Hill Landfill Operable Unit. Section I of the Index cites site-specific documents and Section II cites guidance documents used by Army staff in selecting a response action at the site. Some documents in the Administrative Record File Index have been cited but not physically included. A document has been cross-referenced to another Administrative Record File Index as well as the available corresponding comments and responses have been cross-referenced as well.

The Administrative Record File is available for public review at EPA Region I's Office in Boston, Massachusetts, at the Fort Devens Environment Management Office, Fort Devens, Massachusetts, and at the Ayer Town Hall, 1 Main Street, Ayer, Massachusetts. Supplemental/Addendum volumes may be

added to this Administrative Record File. Questions concerning the Administrative Record should be addressed to the Fort Devens Base Realignment and Closure Office (BRAC).

The Administrative Record is required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA).

Section I

Site-Specific Documents

ADMINISTRATIVE RECORD FILE INDEX

for
Fort Devens Group 1A Site
Shepley's Hill Landfill Operable Unit

Compiled: September 29, 1995

1.0 Pre-Remedial

1.2 Preliminary Assessment

Cross Reference: The following Reports, Comments, and Response Comments (entries 1 through 6) are filed and cited as entries 16 in minor break 1.2 Preliminary Assessment of the Fort Devens 1A Administrative Record File Index.

Reports

1. "Final Master Environmental Plan for Fort Devens," Argonne National Laboratory (April 1992).
2. "Preliminary Zone II Analysis for the Production Wells at Devens, MA, Draft Report", ETA Inc. (January 1994).

Comments

3. Comments Dated May 1, 1992 from Walter Rolf, Massachusetts Regional Planning Commission on the April 1992 "Final Master Environmental Plan for Fort Devens," Argonne National Laboratory.
4. Comments Dated May 7, 1992 from James P. Byrne, EPA Region on the April 1992 "Final Master Environmental Plan for Fort Devens," Argonne National Laboratory.
5. Comments Dated May 23, 1994 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the January 1994 "Preliminary Zone II Analysis the Production Wells at Fort Devens, MA, Draft Report", ET

Responses to Comments

6. Response Dated June 29, 1992 from Carrol J. Howard, Fort D to the May 7, 1992 Comments from James P. Byrne, EPA Region

3.0 Remedial Investigation (RI)

3.2 Sampling and Analysis Data

Reports

1. Cross Reference: "Method for Determining Background Concentrations - Inorganic Analytes in Soil and Groundwater Devens," ABB Environmental Services, Inc. (January 20, 199 [Filed and cited as entry number 1 in minor break 3.2 Samp and Analysis Data of the Fort Devens Group 1A Sites Administrative Record Index].

3.4 Interim Deliverables

The following Reports and Comments (entries 1 through 2) are fi and cited as entries 1 and 2 in minor break 3.4 of the Group 1A Administrative Record Index File.

Reports

1. "Final Ground Water Flow Model at Fort Devens," Engineerin Technologies Associates, Inc. (May 24, 1993).

Comments

2. Comments Dated February 1, 1993 from James P. Byrne, EPA Region I and D. Lynne Chappell, Commonwealth of Massachuse Department of Environmental Protection on the October 30, "Draft Final Ground Water Flow Model at Fort Devens," Engineering Technologies Associates, Inc.

3.5 Applicable or Relevant and Appropriate Requirements (ARARs)

Cross Reference: The following report (entries 2 and 3) are fi cited as entries 1 and 2 in minor break 3.5 Applicable or Relev Appropriate Requirements (ARARs) of the Fort Devens Groups 3, 5 6 Sites Administrative Record Index unless otherwise noted belo

Reports

1. Cross Reference: "Draft Assessment of Chemical-Specific Applicable or Relevant and Appropriate Requirements (ARARs for Shepley's Hill Landfill and Cold Spring Brook Landfill Devens, Massachusetts," U.S. Army Toxic and Hazardous Mate Agency (May 21, 1992). [Filed and cited as entry number 1

minor break 3.5 Applicable or Relevant and Appropriate Requirements (ARARs) of the Fort Devens Group 1A Sites Administrative Record File Index].

2. "Draft Applicable or Relevant and Appropriate Requirements (ARARs) for CERCLA Remedial Actions," U.S. Army Toxic and Hazardous Materials Agency (May 21, 1992).
3. "Draft Assessment of Location-Specific Applicable or Relev Appropriate Requirements (ARARs) for Fort Devens, Massachusetts," U.S. Army Toxic and Hazardous Materials

Agency (September 1992).

3.6 Remedial Investigation (RI) Reports

Cross Reference: The following Reports, Comments, and Response Comments (entries 1 through 15) are filed and cited in minor br Remedial Investigation (RI) Reports of the Group 1A Administrat Record Index unless otherwise noted below.

Reports

1. "Final Remedial Investigation Report, Group 1A - Volume I, Ecology and Environment, Inc. (April 1993).
2. "Final Remedial Investigation Report, Group 1A - Volume II Ecology and Environment, Inc. (April 1993).
3. "Final Remedial Investigation Addendum Report - Volume I, Environmental Services, Inc. (December 1993)
4. "Final Remedial Investigation Addendum Report - Volume II, "ABB Environmental Services, Inc. (December 1993)
5. "Final Remedial Investigation Addendum Report - Volume III "ABB Environmental Services, Inc. (December 1993)
6. "Final Remedial Investigation Addendum Report - Volume IV, "ABB Environmental Services, Inc. (December 1993)

Comments

7. Comments Dated February 8, 1993 from James P. Byrne, EPA Region I on the December 1992 "Draft Final Remedial Investigations Report," Ecology and Environment, Inc.
8. Comments Dated February 11, 1993 from D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the December 1992 "Draft Final Remedial Investigations Report," Ecology and Environment, Inc.
9. Comments Dated June 1, 1993 from James P. Byrne, EPA Regio on the April 1993 "Final Remedial Investigation Report, Gr - Volume I-II," Ecology and Environment, Inc.
10. Comments Dated June 18, 1993 from D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the April 1993 "Final Remedial Investigation Group 1A - Volume I-II," Ecology and Environment, Inc.
11. Comments Dated September 2, 1993 from James P. Byrne, EPA Region I on the July 26, 1993 "Draft Remedial Investigatio Addendum Report," ABB Environmental Services, Inc.
12. Comments Dated September 9, 1993 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the July 26, 1993 "Draft Remedial Investigat Addendum Report," ABB Environmental Services, Inc.
13. Comments Dated January 21, 1994 from Molly Elder, Commonwealth of Massachusetts Department of Environmental Protection on the December 21, 1993 "Final Remedial Invest Addendum Report'" ABB Environmental Services, Inc.
14. Comments Dated February 15, 1994 from James P. Byrne, EPA Region I on the December 21, 1993 "Final Remedial Investig Addendum Report," ABB Environmental Services, Inc.

Responses to Comments

15. Responses Dated December 21, 1994 from U.S. Army Environmental Center on the following document: "Draft Remedial Investigation Addendum Report," ABB Environmental Services, Inc.

3.7 Work Plans and Progress Reports

Cross Reference: The following Reports, Comments, and Response Comments (entries 1 through 3) are filed and cited in minor break Work Plans and Progress Reports of the Group 1A Administrative Record Index unless otherwise noted below.

Reports

1. "Final Work Plan and Field Sampling Plan - Remedial Investigation," Ecology and Environment, Inc. (February 19

Comments

2. Letter from Carrol J. Howard, Fort Devens to D. Lynne Chap Commonwealth of Massachusetts Department of Environmental Protection (March 3, 1992). Concerning confirmation that is waiving its right to comment on the February 1992 "Final Plan and Field Sampling Plan - Remedial Investigation," Ecology and Environment, Inc.
3. Letter from James P. Byrne, EPA Region I to F. Timothy Pri Fort Devens (March 19, 1992). Concerning approval of the February 1992 "Final Work Plan and Field Sampling Plan - Remedial Investigation," Ecology and Environment, Inc.

4.0 Feasibility Study (FS)

4.1 Correspondence

Cross Reference: The following Letters and Comments (entries 1 2) are filed and cited as entries 1 and 2 in minor break 4.1 Correspondence of the Fort Devens Group 1A Sites Administrative Record Index.

Letters

1. Letter Dated July 25, 1994 from James C. Chambers, Department of Army, Headquarters Fort Devens, Brac Environmental Coordinator, the Army's proposed triggers for implementing contingency remed actions at the Shepley's Hill Landfill Operable Unit at Fort De

Comments

2. Comments Dated August 16, 1994 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the Letter Dated July 25, 1994 from James C. Cham on the Contingency Thresholds for Alternative SHL-2 at Shepley' Landfill.

4.4 Interim Deliverables

Cross Reference: The following documents (entries 1 through 4) filed and cited as entries 1 through 4 in minor break 4.4 Inter Deliverables of the Group 1A Sites Administrative Record File I

Reports

1. "Draft Alternatives Screening Report," ABB Environmental Services, Inc. (July 26, 1993).

Comments

2. Comments Dated September 2, 1993 from James P. Byrne, EPA Region I on the July 26, 1993 "Draft Alternatives Screenin Report." ABB Environmental Services, Inc.
3. Comments Dated September 9, 1993 and September 20, 1993 fr D. Lynne Welsh, Commonwealth of Massachusetts Department o Environmental Protection on the July 26, 1993 "Draft Alter Screening Report." ABB Environmental Services, Inc.

Responses to Comments

4. Responses Dated March 18, 1994 from U.S. Army Environmenta Center on the following document: Draft Alternatives Scre Report, dated July 26, 1993.

4.6 Feasibility Study (FS) Reports

Cross Reference: The following Letters, Reports, Comments, Res to Comments and Responses to Responses to Comments (entries 1 through 16) are filed and cited in minor break 4.6 Feasibility Reports of the Fort Devens Group 1A Sites Administrative Record Index.

Reports

1. "Draft Feasibility Study Shepley's Hill Landfill Operable ABB Environmental Services, Inc. (March 18, 1994).
2. "Revised Draft Feasibility Study, Shepley's Hill Landfill Unit, Fort Devens Feasibility Study for Group 1A Sites," A Environmental Services, Inc. (September 1994).
3. "Revised Draft Shepley's Hill Groundwater Operable Unit Feasibility Study and Contingency Triggers," (Letter Dated November 30, 1994 from Major Pease).
4. "Final Feasibility Study Shepley's Hill Landfill Operable Devens Feasibility Study for Group 1A Sites," ABB Environm Services, Inc. (February 1995).

Comments

5. Comments Dated April 28, 1994 form James P. Byrne, EPA Reg I on the March 18, 1994 "Draft Feasibility Study Shepley's Landfill Operable Unit," (ABB Environmental Services, Inc.
6. Comments Dated May 5, 1994 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the March 18, 1994 "Draft Feasibility Study Hill Landfill Operable Unit," (ABB Environmental Services,
7. Comments Dated November 10, 1994 from James P. Byrne, USEPA, on the "Revised Draft Feasibility Study for Shepley

Landfill Operable Unit," (ABB Environmental Services, Inc.

8. Comments Dated November 15, 1994 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the September 1994 "Revised Draft Feasibility Study for Shepley's Hill Landfill Operable Unit," (ABB Environmental Services, Inc.).
9. Comments Dated January 11, 1995 from James P. Byrne, USEPA on the "Revised Draft Feasibility Study for Shepley's Hill Landfill Operable Unit," ABB Environmental Services, Inc.
10. Comments Dated January 11, 1995 from James P. Byrne, USEPA on the Proposed Feasibility Study Language For Alternative Shepley's Hill Landfill Source Control Operable Unit.
11. Comments Dated January 23, 1995 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the November 30, 1994 "Revised Draft Shepley Groundwater Operable Unit Feasibility Study and Contingency Triggers".
12. Comments Dated March 27, 1995 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the "Final Feasibility Study, Shepley's Hill Landfill Operable Unit," (ABB Environmental Services, Inc.).

Responses to Comments

13. Responses Dated September 1994 from U.S. Army Environmental Center on the following document: Draft Feasibility Study for Shepley's Hill Landfill Operable Unit, Feasibility Study For Group 1 Fort Devens, Massachusetts.
14. Responses Dated February 1995 from U.S. Army Environmental Center on the following document: revised Draft Feasibility Study for Shepley's Hill Landfill Operable Unit, Feasibility Study for Group 1A Sites, Fort Devens, Massachusetts.

Responses to Responses to Comments

15. Rebuttal Dated November 15, 1994 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the Responses to Comments on the Draft Feasibility Study, Shepley's Hill Landfill Operable Unit.
16. Responses Dated June 1995 from U.S. Army Environmental Center on the following documents: Final Feasibility Study, Draft Proposed Plan and Draft Fact Sheet for Shepley's Hill Landfill Operable Unit.

4.7 Work Plans and Progress Reports

Cross Reference: The following Reports, Comments, and Response Comments (entries 1 through 10) are filed and cited in minor by Work Plans and Progress Reports of the Fort Devens Group 1A Site Administrative Record Index unless otherwise noted below.

Reports

1. "Final Feasibility Study Work Plan," ABB Environmental Services, Inc. (August 1992).
2. "Final Data Gap Activity Work Plan," ABB Environmental Services, Inc.

Inc. (March 31, 1993).

Comments

3. Comments Dated September 14, 1992 from James P. Byrne, EPA Region I on the August 1992 "Final Feasibility Study Work ABB Environmental Services, Inc.
4. Comments Dated September 21, 1992 from D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the August 1992 "Final Feasibility Study Work ABB Environmental Services, Inc.
5. Comments Dated January 11, 1993 from James P. Byrne, EPA Region I on the December 1992 "Draft Final Data Gap Activity Work Plan," ABB Environmental Services, Inc.
6. Comments Dated January 20, 1993 from D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the December 1992 "Draft Final Data Gap Activity Work Plan," ABB Environmental Services, Inc.
7. Comments Dated February 17, 1993 from James P. Byrne, EPA Region I and D. Lynne Chappell, Commonwealth of Massachusetts Department of Environmental Protection on the December 1992 "Draft Final Data Gap Activities Work Plan," ABB Environmental Services, Inc.
8. Comments Dated April 21, 1993 and April 26, 1993 from James P. Byrne, EPA Region I on the March 31, 1993 "Final Data Gap Activity Work Plan," ABB Environmental Services, Inc.
9. Comments Dated May 13, 1993 from D. Lynne Chappell on the March 31, 1993 "Final Data Gap Activity Work Plan," ABB Environmental Services, Inc.

Responses to Comments

10. Responses Dated May 1993 from U.S. Army Environmental Center on the following document: Final Data Gap Activity Work Plan dated March 31, 1993.

4.9 Proposed Plan for Selected Remedial Action

1. Cross Reference: "Draft Proposed Plan, Shepley's Hill Landfill AOCs 4, 5, & 18, Fort Devens, Massachusetts," ABB Environmental Services, Inc. (February 1995). [Filed and cited as entry in minor break 4.9 Proposed Plan for Selected Remedial Action in the Fort Devens Group 1A Sites Administrative Record File Index.]
2. Cross Reference: "Proposed Plan, Shepley's Hill Landfill AOCs 4, 5, & 18, Fort Devens, Massachusetts," ABB Environmental Services, Inc. (May 1995). [Filed and cited as entry number 2 in minor break 4.9 Proposed Plan for Selected Remedial Action in the Fort Devens Group 1A Sites Administrative Record File Index.]

Comments

3. Cross Reference: Comments Dated March 30, 1995 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the February 1995 "Draft Proposed Plan, Shepley's Hill Landfill," (ABB Environmental Services, Inc.) [Filed and cited as entry number 3 in minor break 4.9 Proposed Plan for Selected Remedial Action in the Fort Devens Group 1A Sites Administrative Record File Index.]
4. Cross Reference: Comments Dated July 17, 1995 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the February 1995 "Draft Proposed Plan, Shepley's Hill Landfill," (ABB Environmental Services, Inc.) [Filed and cited as entry number 3 in minor break 4.9 Proposed Plan for Selected Remedial Action in the Fort Devens Group 1A Sites Administrative Record File Index.]

Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the May 1995 Proposed Plan for Shepley's Hill Landfill Operable Unit, Fort Devens, Massac (ABB Environmental Services, Inc.).

Responses to Comments

5. Cross Reference: Responses Dated June 1995 from U.S. Army Environmental Center on the following documents: Final Feasibility Study, Draft Proposed Plan and Draft Fact Shee Shepley's Hill Landfill Operable Unit. [Filed and cited a number 19 in minor break 4.6 Proposed Plan for Selected Remedial Action in the Fort Devens Group 1A Sites Administrative Record File Index.]

5.0 Record of Decision

Cross Reference: The following Reports, Comments, and Response Comments (entries 1 through 6) are filed and cited in minor bre Record of Decision of the Fort Devens Group 1A Sites Administra Record Index unless otherwise noted below.

5.4 Record of Decision

Reports

1. "Draft Record of Decision Shepley's Hill Landfill Operable Fort Devens, Massachusetts", ABB Environmental Services, I (July 1995).
2. "Revised Draft Record of Decision Shepley's Hill Landfill Unit, Fort Devens, Massachusetts", ABB Environmental Servi Inc. (August 1995).
3. "Final Record of Decision Shepley's Hill Landfill Operable Fort Devens, Massachusetts", ABB Environmental Services, I (September 1995).

Comments

4. Comments Dated August 17, 1995 from James P. Byrne, USEPA Region I on the July 1995 Draft Record of Decision for She Hill Landfill Operable Unit, Fort Devens, Massachusetts (A Environmental Services, Inc.).
5. Comments Dated August 18, 1995 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the July 1995 Draft Record of Decision, Shep Hill Landfill Operable Unit, Fort Devens, Massachusetts (A Environmental Services, Inc.).
6. Comments Dated September 13, 1995 from James P. Byrne, USEPA Region I on the August 1995 Revised Draft Record of Decision Shepley's Hill Landfill Operable Unit, Fort Deven Massachusetts (ABB Environmental Services, Inc.).

6.0 Remedial Design (RD)

6.6 Work Plans and Progress Reports

Cross Reference: The following Reports and Comments (entries 1

through 3) are filed and cited in minor break 6.6 Remedial Design Work Plans and Progress Reports of the Fort Devens Group 1A Site Administrative Record Index unless otherwise noted below.

Reports

1. "Final Delivery Order Work Plan for Predesign Investigation Areas of Contamination (AOCs) 4, 5, & 18 Shepley's Hill Landfill, Fort Devens, Massachusetts," Stone & Webster Environmental Technology & Services (June 1995).

Comments

2. Comments Dated July 11, 1995 from James P. Byrne, USEPA Region I on the June 1995 Final Delivery Order Work Plan for Predesign Investigations Shepley's Hill Landfill, Fort Devens, Massachusetts" (Stone & Webster Environmental Technology & Services).
3. Comments Dated July 26, 1995 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the June 1995 Final Delivery Order Work Plan Areas of Contamination (AOCs) 4, 5, & 8, Shepley's Hill Landfill.

10.0 Enforcement

10.16 Federal Facility Agreements

1. Cross Reference: "Final Federal Facility Agreement Under CERCLA Section 120," EPA Region I and U.S. Department of the Army (November 15, 1991) with attached map [Filed and cited as entry number 1 in minor break 10.16 Federal Facility Agreements of the Fort Devens Group 1A Sites Administrative Record Index].

13.0 Community Relations

13.2 Community Relations Plans

Reports

1. Cross Reference: "Final Community Relations Plan," Ecology and Environment, Inc. (February 1992) [Filed and cited as entry number 1 in minor break 13.2 Community Relations Plans of the Fort Devens Group 1A Sites Administrative Record Index].
2. Cross Reference: "Fort Devens Community Relations Plan for Environmental Restoration, 1995 Update," ABB Environmental Services, Inc. (May 1995). [Filed and cited as entry number 2 in minor break 13.2 Community Relations Plans of the Fort Devens Group 1A Sites Administrative Record Index].

Comments

3. Cross Reference: Letter from James P. Byrne, EPA Region I to Timothy Prior, Fort Devens (March 19, 1992). Concerning approval of the February 1992 "Final Community Relations Plan" Ecology and Environment, Inc. [Filed and cited as entry number 3 in minor break 13.2 Community Relations Plans of the Fort Devens Group 1A Sites Administrative Record Index].
4. Cross Reference: Comments Dated July 17, 1995 from James

Byrne, USEPA, Region I, on the May 1995 Fort Devens Community Relations Plan for Environmental Restoration, 19 Update (ABB Environmental Services, Inc.). [Filed and cited as entry number 4 in minor break 13.2 Community Relations Plan the Fort Devens Group 1A Sites Administrative Record Index]

13.5 Fact Sheets

1. Cross Reference: "Shepley's Hill Landfill Draft Fact Sheet Devens, Massachusetts," ABB Environmental Services, Inc. (February 1995). [Filed and cited as entry number 1 in minor break 13.5 Fact Sheets of the Group 1A Sites Administrative Record Index.]
2. Cross Reference: "Fact Sheet 2, Shepley's Hill Landfill Plan, Fort Devens, Massachusetts Environmental Restoration Program," ABB Environmental Services, Inc. (May 1995). [Filed and cited as entry number 2 in minor break 13.5 Fact Sheet Group 1A Sites Administrative Record File Index.]

Comments

3. Cross Reference: Comments Dated March 30, 1995 from D. Ly Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the February 1995 "Shepley's Hill Landfill Draft Fact Sheet, Fort Devens, Massachusetts," (ABB Environmental Services, Inc.). [Filed and cited as entry number 3 in minor break 13.5 Fact Sheets of the Group 1A Sites Administrative Record File Index.]

Responses to Comments

4. Cross Reference: Responses Dated June 1995 from U.S. Army Environmental Center on the Final Feasibility Study, Draft Proposed Plan and the Draft Fact Sheet, Shepley's Hill Landfill Operable Unit, Fort Devens, Massachusetts. [Filed and cited as entry number 19 in minor break 4.6 Feasibility Study Report Group 1A Sites Administrative Record File Index.]

13.11 Technical Review Committee Documents

Cross Reference: The following Reports, Comments, and Response Comments (entries 1 through 8) are filed and cited in minor break 13.11 Technical Review Committee Documents of the Group 1A Sites Administrative Record Index unless otherwise noted below.

1. Technical Review Committee Meeting Agenda and Summary (March 21, 1991).
2. Technical Review Committee Meeting Agenda and Summary (June 27, 1991).
3. Technical Review Committee Meeting Agenda and Summary (September 17, 1991).
4. Technical Review Committee Meeting Agenda and Summary (December 11, 1991).
5. Technical Review Committee Meeting Agenda and Summary (March 24, 1992).
6. Technical Review Committee Meeting Agenda and Summary (June 23, 1992).
7. Technical Review Committee Meeting Agenda and Summary (September 29, 1992).

8. Technical Review Committee Meeting Agenda and Summary (January 5, 1993).

17.0 Site Management Records

17.6 Site Management Plans

Cross-Reference: The following Reports, Comments, and Responses to Comments (entries 1 through 9) are filed and cited in minor break 1 Management Records of the Groups 3, 5, & 6 Administrative Record In unless otherwise noted below.

Reports

1. "Final Quality Assurance Project Plan," Ecology and Enviro Inc. (November 1991).
2. "General Management Procedures, Excavated Waste Site Soils Fort Devens, Massachusetts," ABB Environmental Services, I (January 1994).
3. "Final Project Operations Plan, Fort Devens, Massachusetts Environmental Services, Inc. (May 1995).
4. "Project Operations Plan, Fort Devens, Massachusetts," ABB Environmental Services, Inc. (June 1995).

Comments

5. Cross Reference: Comments from James P. Byrne, EPA Region on the November 1991 "Final Quality Assurance Project Plan Ecology and Environment, Inc. [These Comments are filed a cited as a part of entry number 8 in the Responses to Comm section of this minor break].
6. Comments Dated December 16, 1993 from Molly J. Elder, Commonwealth of Massachusetts Department of Environmental Protection on the November 1993 "Draft General Management Procedures, Excavated Waste Site Soils, Fort Devens, Massachusetts," ABB Environmental Services, Inc.
7. Comments Dated December 27, 1993 from James P. Byrne, EPA Region I on the November 1993 "Draft General Management Procedures, Excavated Waste Site Soils, Fort Devens, Massachusetts," ABB Environmental Services, Inc. [Filed a as entry number 4 in minor break 4.4 Interim Deliverables AOCs 44/52 Administrative Record Index.]
8. Comments Dated March 11, 1994 from D. Lynne Welsh, Commonwealth of Massachusetts Department of Environmental Protection on the January 1994 "General Management Procedu Excavated Waste Site Soils, Fort Devens, Massachusetts," A Environmental Services, Inc.

Responses to Comments

9. Cross-Reference: U.S. Army Environmental Center Responses Comments on the following documents: Feasibility Study Re Biological Treatability Study Report; Feasibility Study Re New Alternative 9; Draft General Management Procedures Excavated Waste Site Soils; and Draft Siting Study Report, January 25, 1994. [These Responses to Comments are filed cited as a part of entry number 7 in the Responses to Comm

section of minor break 4.4 Interim Deliverables of the AOC Administrative Record Index.]

Responses to Comments

10. Response from Fort Devens to Comments from James P. Byrne, EPA Region I on the November 1991 "Final Quality Assurance Project Plan," Ecology and Environment, Inc.
11. Cross-Reference: U.S. Army Environmental Center Responses Comments for the following documents: Final Feasibility S Report; Draft Proposed Plan; Revised Draft Proposed Plan; Excavated Soils Management Plan; Final General Management Procedures Excavated Waste Site Soils; and Biological Trea Study Report, dated May 1994. [These Responses to Comment are filed and cited as entry number 8 in the Responses to Comments section of minor break 4.4 Interim Deliverables o AOCs 44/52 Administrative Record Index.]

17.9 Site Safety Plans

Cross Reference: The following Reports and Comments (entries 1 through 3) are filed and cited as entries 1 through 3 in minor Site Safety Plans of the Group 1A Sites Administrative Record F Index unless otherwise noted below.]

Reports

1. "Final Health and Safety Plan," Ecology and Environment, I (November 1991).

Comments

2. Cross Reference: Comments from James P. Byrne, EPA Region on the November 1991 "Final Health and Safety Plan," Ecolo Environment, Inc. [These Comments are filed and cited as entry number 8 in minor break 17.6 Site Management Plans o Group 1A Sites Administrative Record File Index].

Responses to Comments

3. Response from Fort Devens to Comments from James P. Byrne, EPA Region I on the November 1991 "Final Health and Safety Plan," Ecology and Environment, Inc.
Reports

Section II

Guidance Documents

GUIDANCE DOCUMENTS

The following guidance documents were relied upon during the Fort Devens cleanup. These documents may be reviewed, by appointment only, at the Environmental Management Office at Fort Devens, Massachusetts.

1. Occupational Safety and Health Administration (OSHA). Hazardous Waste Operation and Emergency Response (Final Rule, 29 CFR Part 1910, Federal Register. Volume 54, Number 42) March 6, 1989.
2. USATHAMA. Geotechnical Requirements for Drilling Monitoring Well, Data Acquisition, and Reports, March 1987.
3. USATHAMA. IRDMIS User's Manual, Version 4.2, April 1991.
4. USATHAMA. USATHAMA Quality Assurance Program: PAM-41, January 1990.
5. USATHAMA. Draft Underground Storage Tank Removal Protocol - Fort Devens, Massachusetts, December 4, 1992.
6. U.S. Environmental Protection Agency. Guidance for Preparation of Combined Work/Quality Assurance Project Plans for Environmental Monitoring: OWRS QA-1, May 1984.
7. U.S. Environmental Protection Agency. Office of Research and Development Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans: QAMS-005/80, 1983.
8. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Interim Final Guidance for Conducting Remedial Investigation and Feasibility Studies Under CERCLA, (OSWER Directive 9355.3-01, EPA/540/3-89/004, 1986.
9. U.S. Environmental Protection Agency. Test Methods for Evaluating Solid Waste: EPA SW-846 Third Edition, September 1986.
10. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual (Part A), (EPA/540/1-89/002), 1989.
11. U.S. Environmental Protection Agency. Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Toxicity Characteristic Revisions, (Final Rule, 40 CFR Part 261 et al., Federal Register Part V), June 29, 1990.

RECORD OF DECISION

Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

APPENDIX E - DECLARATION OF STATE CONCURRENCE

W0099518.080

1 508 792 7621

09-25-1995 11:11

1 508 792 7621

MASS. DEP/CENTRAL REGION

Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of
Environmental Protection
Central Regional Office

William F. Weld
Governor
Trudy Coke
Secretary, EOE
David B. Struhs
Commissioner

September 18, 1995

Mr. John De Villars
Regional Administrator
U.S. Environmental Protection Agency
Region I
JFK Federal Building
Boston, MA 02203

RE: ROD Concurrence, Shepley's Hill Landfill, AOCs 4, 5 and 18,
Fort Devens, MA

Dear Mr. De Villars:

The Massachusetts Department of Environmental Protection (MADEP) has reviewed the preferred remedial alternative recommended by the Army and the EPA for the final cleanup of the Shepley's Hill Landfill, the core provisions of which are summarized below. The MADEP has worked closely with the Army and EPA in the development of the preferred alternative and is pleased to concur with the Army's choice of the remedial alternative.

The MADEP has evaluated the preferred alternative for consistency with M.G.L. c. 21E (21E) and the Massachusetts Contingency Plan (MCP). The remedial alternative addresses the entire landfill as one operable unit and included the following components:

Completion of any outstanding closure requirements identified under 310 CMR 19.000;

Survey of Shepley's Hill Landfill;

Evaluation/improvement of stormwater diversion and drainage;

Landfill cover maintenance;

Long-term groundwater and landfill gas monitoring;

Institutional controls;

Educational programs;

75 Grove Street Worcester, Massachusetts 01605 FAX (508) 792-7621

Printed on Recycled Paper

1 508-792 7621

09-25-1995 11:12

1 508 792 7621

MASS. DEP/CENTRAL REGION

ROD Concurrence
Fort Devens, MA
September 18, 1995

Design of groundwater extraction system;

Annual reporting to MADEP and USEPA; and

Five-year site reviews.

The MADEP's concurrence with the preferred remedial alternative is based upon the expectation that it will result in a permanent solution as defined in 21E and the MCP and that contaminant concentrations achieved during the implementation of the remedial alternative will meet the MCP standards.

The MADEP would like to thank EPA, in particular the Fort Devens Remedial Project Manager, Jim Byrne, for their efforts to ensure that the Massachusetts environmental requirements were met in the selection of the remedial alternative. We look forward to continuing to work with EPA in the implementation of the remedial alternative. If you have any questions, please contact Lynne Welsh at (508) 792-7653, ext. 3851.

Sincerely,

Cornelius O'Leary
Regional Director
MADEP, CERO

cc: Fort Devens Mailing List (cover letter only)
Edward Kunce, MADEP
Jay Naparstek, MADEP
Informational Repositories
Jim Byrne, EPA
Charles George, AEC
Mark Applebee, ACOE
Judy Kohn, Mass Land Bank

RECORD OF DECISION
Shepley's Hill Landfill Operable Unit
Fort Devens, Massachusetts

APPENDIX F - GLOSSARY OF ACRONYMS AND ABBREVIATIONS

W0099518.080

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

AOC	Area of Contamination
ARAR	Applicable or Relevant and Appropriate Requirement

AWQC	Ambient Water Quality Criteria
BRAC	Base Realignment and Closure Act
CAC	Citizen's Advisory Committee
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMR	Code of Massachusetts Regulations
DDD	2,2-bis(para-chlorophenyl)-1,1-dichloroethane
DDE	2,2-bis(para-chlorophenyl)-1,1-dichloroethane
DDT	2,2-bis(para-chlorophenyl)-1,1,1-trichloroethane
DRMO	Defense Reutilization and Marketing Office
FS	Feasibility Study
HI	Hazard Index
IAG	Interagency Agreement
IRP	Installation Restoration Program
MADEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MEP	Master Environmental Plan
MGD	million gallons per day
MMCL	Massachusetts Maximum Contaminant Level
NPL	National Priorities List
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
PCB	polychlorinated biphenyl
POTW	publicly owned treatment works
ppb	parts per billion
PVC	polyvinyl chloride
W0099518.080	

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RI	remedial investigation
SA	Study Area
SARA	Superfund Amendments and Reauthorization Act of 1986
SVOC	semivolatile organic compound
TAL	Target Analyte List
TCL	Target Compound list
TOC	total organic carbon
TRC	Technical Review Committee
æg/L	micrograms per liter
USAEC	U.S. Army Environmental Center

USEPA U.S. Environmental Protection Agency

VOC volatile organic compound

W0099518.080